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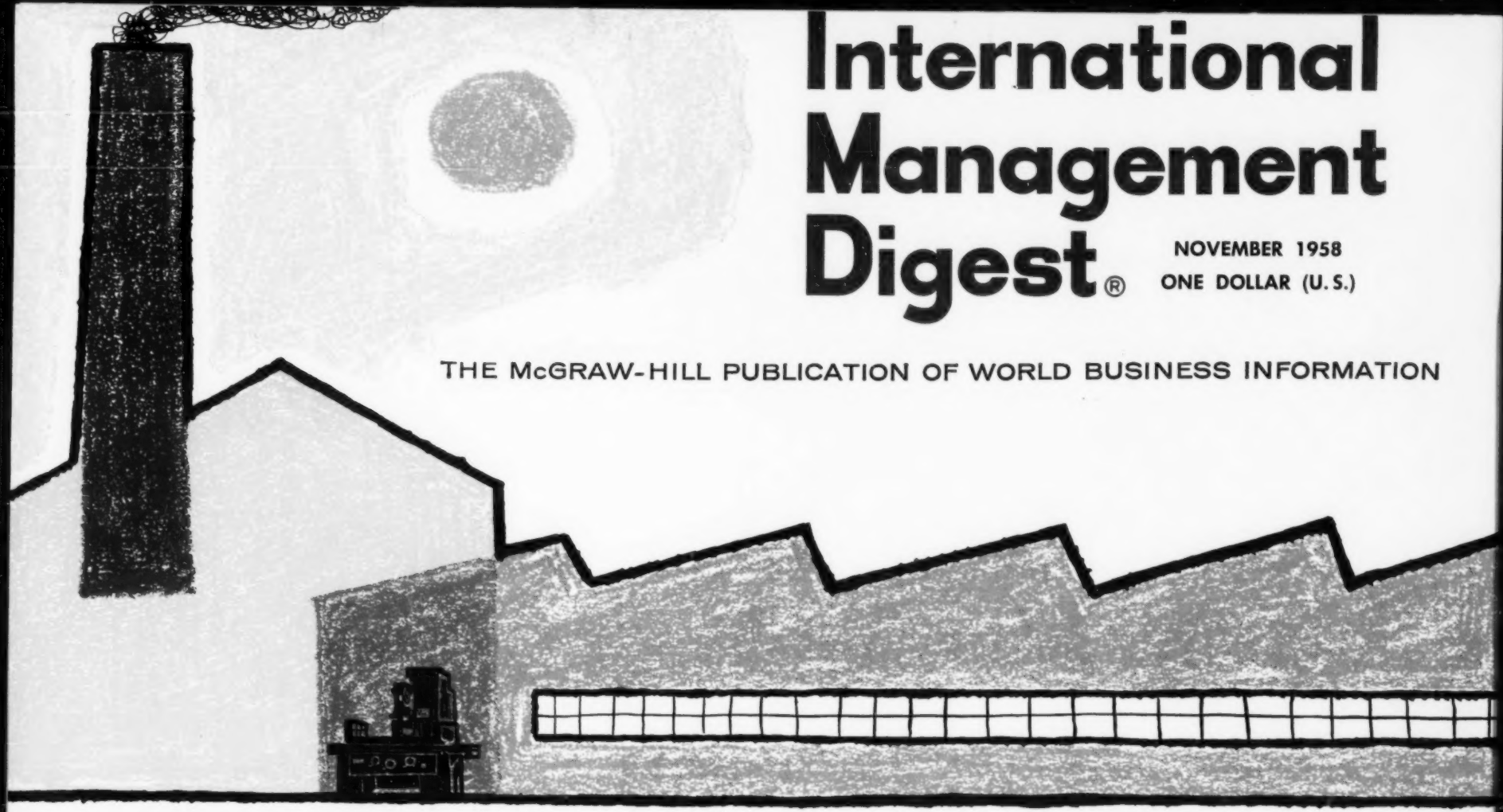
NOVEMBER 1958
ONE DOLLAR (U.S.)

THE McGRAW-HILL PUBLICATION OF WORLD BUSINESS INFORMATION



PLAN '59

Modernize now for growth and profits

A SPECIAL REPORT FROM McGRAW-HILL TO BUSINESS EXECUTIVES

RENEWING INDUSTRY–

The Capital Outlay—page 9
Impact of Technology—page 18
Management's Role—page 35

O.S.

MODERN PIPE-LINE CONSTRUCTION

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World Affairs

Business Activity in the U.S.A.

U.S. businessmen are smiling again. Practically all economic indices are moving upward, some slightly, others with giant strides.

Industrial production is gaining steadily. Retail sales are reaching toward a new high. Steel production has moved from a recession point of 49% of capacity to more than 65% of capacity. And construction apparently will set a new record for 1958.

The upward surge of the stock market has brought smiles—and a trace of nervousness. Stocks have moved from one high to another. The speed of the ascent has puzzled many, in view of the poor earnings of most firms during the first three quarters of the year.

But Wall Street was generally optimistic, as this was written. The consensus was that stocks were anticipating a favorable fourth quarter and continuing prosperity far into the future.

Across the Atlantic, European experts were skeptical of Wall Street prosperity. Stock prices from a distance seemed unrealisticaliy high—and many felt that the rise was due to inflation fears as much as to the promise of good times.

Uncertainties in U.S.A.'s current outlook still exist on two fronts: employment and cars. Unemployment, at last count, was near 4,700,000—about 7.6 per cent of the total labor force. The position of automobiles was as yet unproved.

1959 Autos Make Their Bow

Display of Detroit's first 1959 models came with mid-September—but some weeks later, it was not clear how they were being received by the American public. The U.S. consumer has money, but he has become increasingly temperamental in his buying habits (see page 16).

Experts are still arguing about whether he shied away from car-buying in 1957 because of the product and price, or because of general uneasiness.

The 1959 models of the Big Three—Ford, Chrysler and General Motors—will be the test. If the U.S. consumer is looking for a smaller, plainer and more economical car, as industry critics insist, he won't find it here.

If anything, the 1959 cars are larger, more ornate and more full of gadgets than a year ago. Initial price often will be higher. Material changes have been made—especially in Ford and General Motors cars—but they have been mainly in styling, added comforts, more standardization.

General Motors, in a rather revolutionary change, has come up with a body shell that is common to all its cars. The marketing distance between the firm's Chevrolet and Cadillac thereby narrows further.

As 1959 cars moved into showrooms, disconcerting statistics were piling up on the sale of European cars in the U.S. For the first half of 1958 the figure was 160,000 cars—twice what it was during the same period last year. West Germany accounted for about 40%, Britain a little less.

U.S. big-car manufacturers had little solace when they combined these import figures with the record being set by American Motor's small Rambler—about 80,000 during the first half of 1958—and the small-car threat

Turn the page for more WORLD AFFAIRS

of Studebaker-Packard. A full-year sale of 500,000 small cars in the U.S.A. may be in the offing.

Then why do the Big Three continue to make plush limousines? *Business Week* finds at least part of the answer in the fact that it takes U.S. carmakers three years to conceive, design and market a new auto.

When the present new models were conceived—back in the fall of 1955—the U.S. economy was buzzing and the U.S. customer looking for new luxuries. Now the auto industry is hastily trying to swing its design and tooling facilities around—for a smaller, and perhaps cheaper, car in 1960.

The Commodities

The ups and downs of primary materials still plague many national economies. But panicky fears generally have subsided, concurrent with bettering U.S. conditions—and the promise of more U.S. trade.

Copper and aluminum are improved—at least temporarily. Many other commodities are still plagued by oversupply and low prices.

Tin: Many observers now concede that Russian sales are not entirely to blame. The Tin Council has made mistakes—raising its base support price, for instance, when prices were falling; and support purchases have been abandoned. But there seems to be a new determination to make the International Agreement work. Prices have steadied; production is below consumption.

Lead & Zinc: Producers were shocked by new import quotas imposed by the United States (which has only 3,000—out of 17,000 workers in the industry—unemployed). Trade missions have been hastily organized to find new markets. But the U.S. restrictions increased the pressure for an international production agreement.

Coffee: The marketing agreement among Latin American producers has been renewed and extended: Brazil will withhold 40% of its current crop; Columbia, 15%; the other countries, 5%. But no agreement has been reached with the African producers. The Africans are reluctant to cut their exports, but demand rigid guarantees against the huge Brazilian surpluses; the Brazilians still talk of a price war. Meanwhile, estimates of the 1958-59 crop have been raised again.

Wool: Prices have been depressed since early 1957. Consumption is not increasing; producers are searching for new markets in Asia and the Communist countries. And the synthetic-fiber manufacturers are taking aim at the winter-weight clothing market.

The Trend of Business

There is excited talk in business circles about Britain's new liberalized trade policies. Out of the recent **Commonwealth Conference** in Montreal came a further freeing of dollar imports, a promise to make sterling convertible as soon as possible. Britain and Canada also pledged assistance loans to underdeveloped Commonwealth countries.

U.S. direct investments abroad were $3,000-million in 1957, bringing the total to $37,000-million. Earnings were $3,300-million, up 7% over 1956. Petroleum companies invested the most, $1,700-million, and accounted for almost all of the increase in earnings.

Japan, already fourth in world plastic production, will have a new $70-million petrochemical center ready within two years—a joint venture involving six companies. . . . **Leo Pharmaceutical Products** of Copenhagen will build a Continental packaging plant in The Netherlands, to be followed with manufacturing facilities. . . . **Sahara** petroleum exploration is being stepped up, with 12 groups taking over new desert concession areas.

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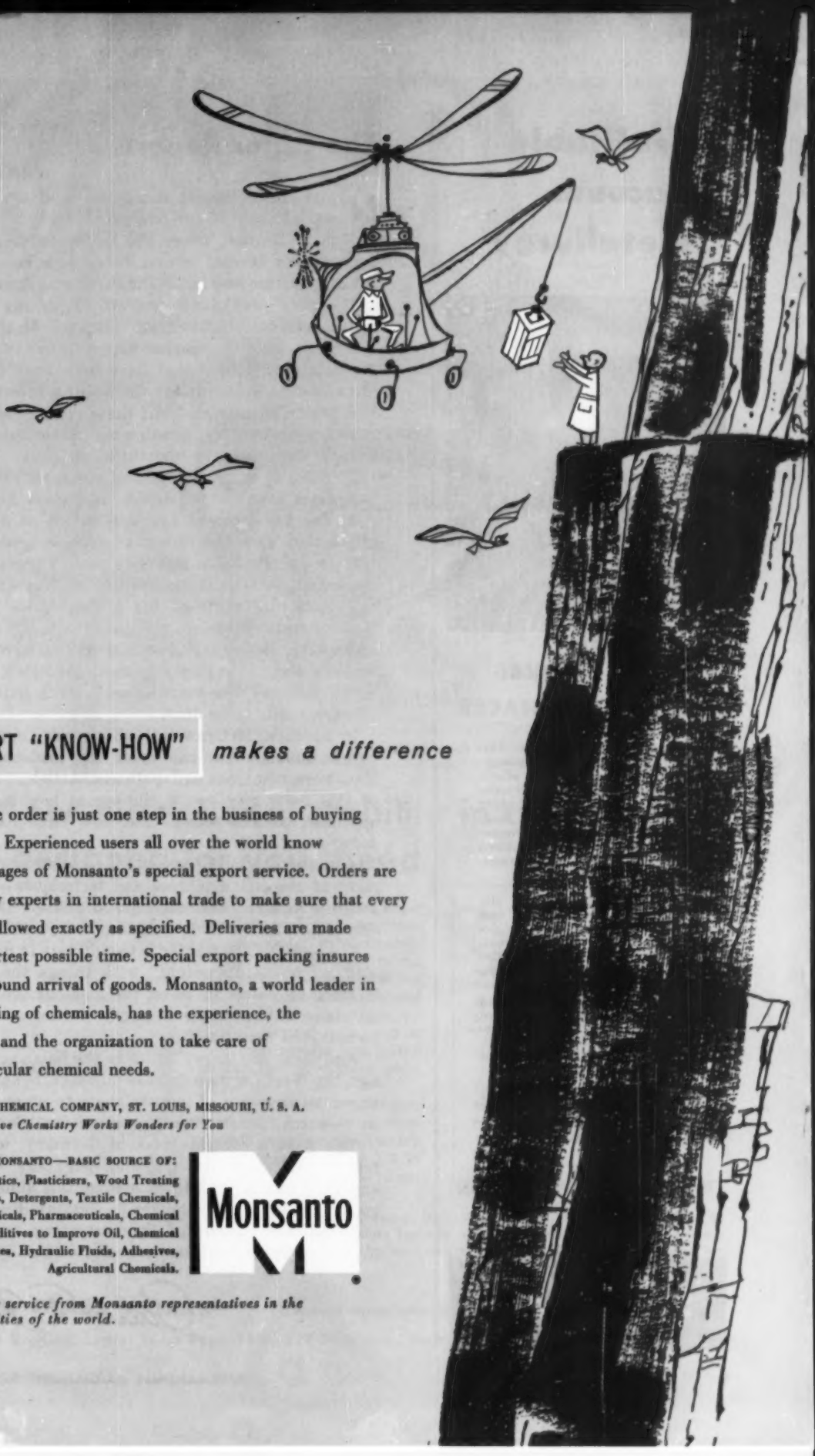

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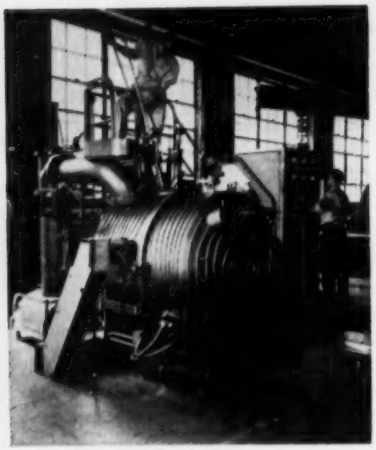

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STOKES

The Editor Reports . . .

NOW IS A GOOD TIME to take stock, and ask: "How modern and efficient is our business?"

Here in Europe, where the Editor has been visiting subscribers for several weeks, there is a keen realization of the competition implicit in the expanding continental market.

We have seen plants and offices putting their facilities into superb competitive trim. They will be the leaders; they will profit from the market opportunities of the 1960s. But we have seen others that have been unable to fulfill some of the essential conditions for healthy growth.

A Dutch industrialist put these conditions as follows:

1. An efficient organization capable of being continuously adapted to necessary structural changes.
2. Efficient technological and economic research.
3. Good welfare provisions and good human relations.
4. The development and application of new methods of production with the object of raising productivity.

Obvious? Perhaps. But they make a useful catechism for the executive who is determined to stay up-to-date.

This month, many of the McGraw-Hill publications are turning their editorial spotlight on the business of staying up-to-date. McGraw-Hill correspondents abroad have looked into the state of industry in their countries. These reports, which you will find starting on page 9, indicate that a lot of work needs to be done.

In addition, McGraw-Hill editors are suggesting ways in which management can meet the problems of replacing time-worn machines and methods. Articles in other sections of this issue give you a glimpse at how management can approach modernization, and how they have profited by doing so.

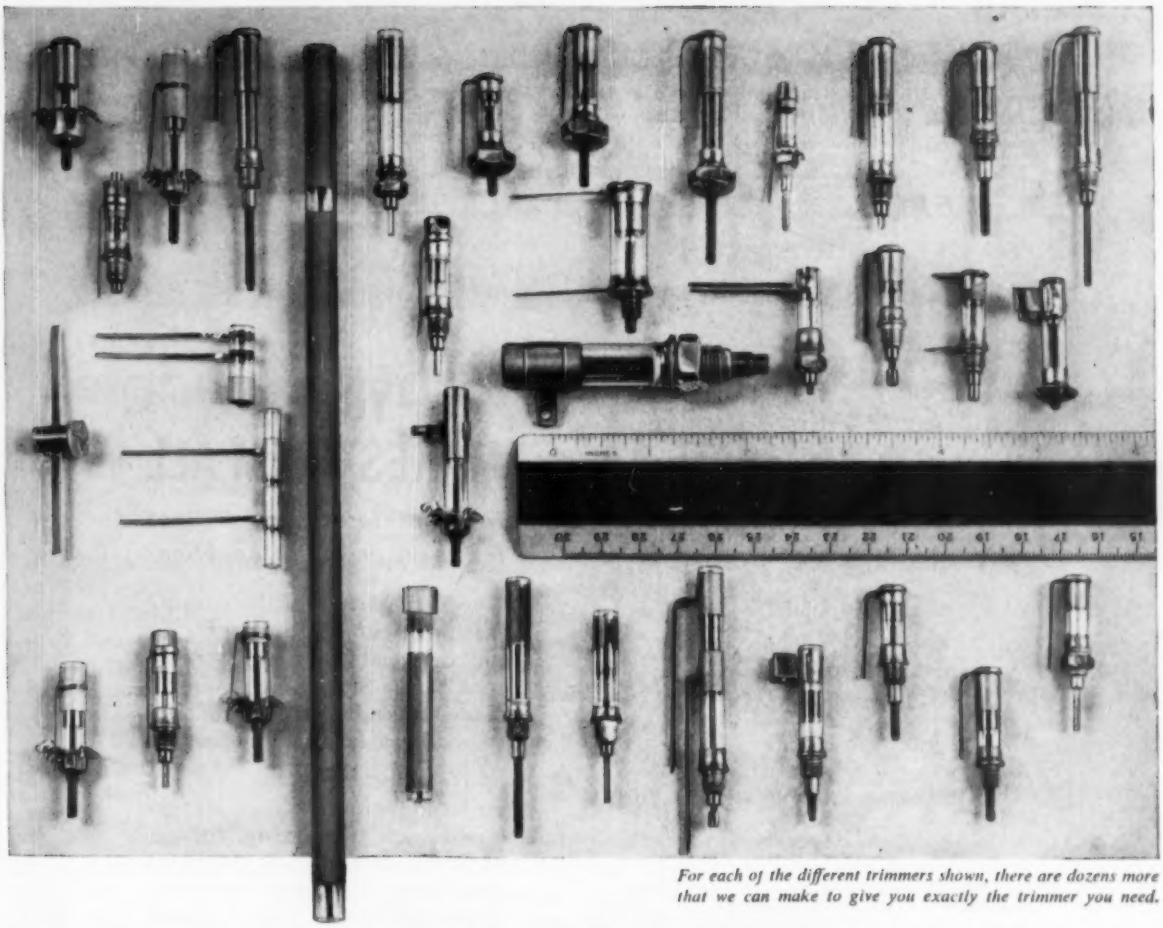
A modernization program may involve a wholesale retirement of obsolete machines and techniques—to the limit of a firm's financial and managerial ability. Or it may mean only a new approach to planning or operations.

The heart of the matter is to cultivate in management and staff a "divine discontent" with things the way they are, to train all hands to be on the look-out for improvements. At stake is the future of every worker and manager, the owners, the firm itself.

And there are larger issues in the balance. A few months ago, the West German defense minister, Franz Josef Strauss, urged an audience of industrialists to place more emphasis on research, development, productivity. Said Strauss:

"We have a concrete task in Germany, which is not directed against our friends and neighbors, but consists of engaging jointly with them in a contest aimed at a common goal. This goal will no longer be German, French, or American, but will consist of demonstrating what weight the Free World can put into the scales of history."

Paul R. Miller, jr



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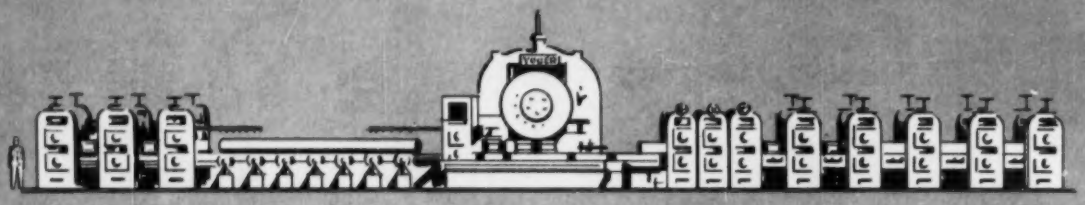

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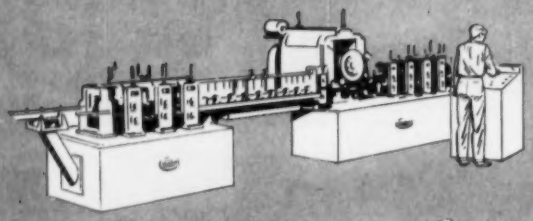

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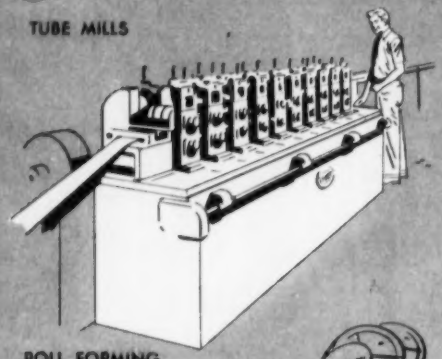

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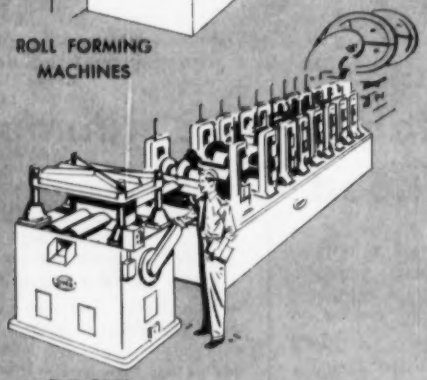

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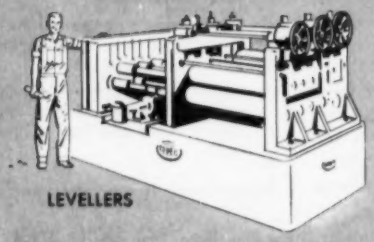

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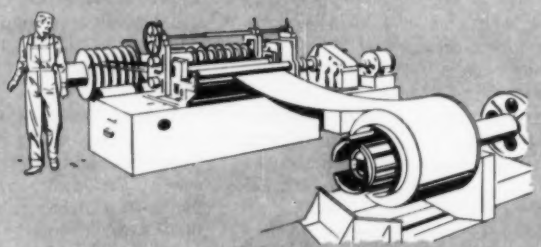

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PLAN '59

Industry must spend more on modernization if it is to meet the competitive challenges of 1959 and the 1960s. So say businessmen of 10 nations, who are right now . . .

Weighing Future Investment Needs

IT IS THE TIME of budgets, and plans for 1959. Many businessmen are making a more careful appraisal of their own, and their nation's, plant and equipment. They are not all pleased with what they see:

—**From a Brazilian:** "In the old days it was cheaper to use men than machines, but now—with rising labor costs—we must mechanize and modernize."

—**From West German worriers,** an insistence that lagging government and industrial research will turn Germany into a "backward country" in 25 years.

—**From an American economist:** "Our plants are not modern enough, not efficient enough, to meet today's challenges."

—**From a Cuban sugar baron:** "We must modernize or die."

Several distinct threads run through these comments, and the many others like them that INTERNATIONAL MANAGEMENT DIGEST has heard. European executives are acutely conscious of the challenge that economic integration presents to plants that are not up-to-the-mark competitively. Each week brings news of technological advances that management must take into account. Rising costs—especially wages—squeeze profits. And throughout the world, the population "explosion" creates more mouths to feed, more expectations to fulfill.

If world industry is to meet these problems, and to avoid ruinous inflation in the bargain, it must keep output per worker constantly rising. If the individual enterprise is to grow, profitably, it must produce better goods—and more of them—at lower prices.

Such economists' talk may sound unrealistic after 10 years of heavy capital investment, and at a moment when many industries are working below capacity. Gains in output and productivity have been substantial in many nations, phenomenal in a few. Yet frequently —and the U.S.A. is a prime example—modernization of industry has been neglected in the rush to expand capacity.

The situation gives rise to some startling figures. Fast-growing Canada recently conducted its first "census" of machinery. Type, location, age of 262,000 pieces of major production equipment were listed. The result: 17% of Canada's metalworking equipment was over 20 years old (about the same as in the U.S.A.), 35% over 10 years. Were it not for the modern aircraft industry, the average age of Canadian machinery would have been higher.

To get a better understanding of the state of the world's capital plant, and its needs for the future, INTERNATIONAL MANAGEMENT DIGEST's correspondents have talked with businessmen and economists in some of the important industrial (and industrializing) nations. Here is their report:

UNITED STATES

As it leaves the recession of 1958 behind, the U.S.A. seems to be entering a new period of economic growth. But the conditions of growth may be different from those of the years 1947-57.

For many industrial firms, growth will not mean pressure on capacity. It will not mean easy profits. Rather, growth will take place under highly competitive conditions, with profits depending on management's ability to hold down costs.

The McGraw-Hill Dept. of Economics was curious to see how U.S. equipment measured up to the challenges of competitive growth at home and "competitive co-existence" abroad. It has just released the results of a survey that shows a large percentage of American equipment dates back to World War II and beyond. And the survey places the cost of modernizing American industry—replacing what is really obsolete by today's production standards—at a staggering $95,000-million.

The economists add that rapid technological changes pressed industry with new problems of obsolescence each year. They suggest that the total cost of removing the backlog of obsolete tools, and keeping up with technical progress, might require $135,000-million of spending in the next five years.

Such figures come as a shock to the American business community, which has invested $291,000-million since 1947. Manufacturing capacity is up 80%, power capacity, 145%. But this gargantuan spending has not made the U.S.A.'s facilities as modern as businessmen suppose. Over half the investment went into expansion of capacity; the remainder has not purchased as much new equipment in recent years as dollar figures suggest, because of rising prices of capital goods.

So today, 50% of America's manufacturing capacity dates back to World War II; and 65% was in-

PLAN 59 *story starts on page 9*

stalled before 1950. Only a third of the nation's metalworking equipment and railroad freight wagons are less than 10 years old.

These examples have dollars-and-cents meaning when you realize that the latest machine tools are 40% more productive than 1948 models, or that a combination of new freight cars and railroad yard equipment could reduce operating costs by 50%.

Productivity figures tell a similar story. Since 1951, output per man hour in manufacturing has risen only 2.5% yearly, compared to 4% in 1947-50. McGraw-Hill economists suggest that machines and methods are available to hit a 5% yearly rise. This is essential, they say, if the U.S.A. is to (1) meet the Soviet economic challenge; (2) provide a higher standard of living for a population that will increase by 32-million in 10 years (and contain many more dependent persons); and (3) avoid inflation as wages continue to rise.

UNITED KINGDOM

Put it down as a good bet that Britain will be stepping up its rate of investment in industrial plant —not tomorrow perhaps, but soon. The reasons are obvious.

Britain knows that if it is to stay a world power, with ever rising living standards, it must at least maintain its industrial position in the face of increasingly harsh competition. Britons are conscious that their share of world trade in manufactures has shrunk from 33% at the turn of the century to 19% today (with half that shrinkage since 1950). And they know that the proportion of national income devoted to industrial modernization and expansion has lagged behind that of several important competitors.

British industrial facilities came out of World War II in better shape than they went in. Since, Britain has been adding to and modernizing its plant at a rate far exceeding prewar. Manpower in manufacturing has risen by only 13.5% while output has increased 42%.

There are some very bright spots. The iron and steel industry has doubled its capacity, spent the equivalent of $1,800-million on expansion and modernization—and expects to add another $1,700-million by 1962. The chemical industry is another front-runner, investing $2,000-million since 1948 and doubling production while increasing employment only 20%. Autos, electronics, electrical equipment industries get high-marks for up-to-date and improving plant.

But impressive figures do not always mean unexceptionable performance. While the machine tool industry has tripled the value of its capital plant, it is often accused of not expanding fast enough and not concentrating on advanced design. Though the situation in tools is improving, the same general weakness—adequacy in standard equipment, lag in advanced design and capacity—has been evident in some other sectors of the capital goods industry.

Several important areas present a spotty picture. In man-made fibers and in woolens, the textile industry has kept in step: The number of automatic looms in woolen mills rose from 4,000 to 12,000 (25% of all in operation) between 1946 and 1955. But the drastically shrinking cotton industry has done little modernizing. Shipbuilding has up-dated methods, but has much antiquated equipment and is accused of not expanding fast enough. Thousands of millions of pounds have been spent mechanizing coal.

Sum up by saying that while there is plenty of out-dated equipment in Britain, the record is good on balance, and industry is competitive. One economist recently estimated that 38% of the fixed assets of British manufacturing is less than 10 years old, and the percentage for machinery is better than that.

But Britain cannot rest on its present plant. The influential *Economist* recently quoted as a commendable investment goal an increase in real investment from the present $9,000-million yearly to $14,000-million.

But it is a matter of national decision on how much the country can afford (particularly in view of Sterling's vulnerability to inflation), and how much it wants to channel into capital plant at the expense of a slower immediate rise in living standards.

WEST GERMANY

German industrialists were kept on a short leash during the early post-war years, but they came thundering back. Taking funds from their own resources and profits, plus Marshall Plan aid, they plowed an estimated $70,000-million into new plant and equipment between 1948 and 1958. Today they believe they have the most modern major industry in Europe—with 43% of its equipment less than five years old, 60% less than 10.

And more spending is ahead: New investment in the next five years is expected to run between $60,000-million and $75,000-million.

Competitively the country has more than regained its share of world markets. Iron and steel, chemicals, autos, electronic and engineering goods are either keeping pace or outdoing the competition. Invariably, success has been the result of investment—amounting to 7% to 9% of sales in some lines, as high as 20% in others.

Yet there are weak spots. Textiles have suffered. Aviation and nuclear energy are moving slowly. Some leaders of the machine tool industry worry that their tools and installations are not as up-to-date as those of competitors such as the U.S.A. And every German manager is concerned about labor's demand for higher wages, shorter hours.

Thus, barring a more serious recession than anyone expects, the spur to investment remains. Agriculture, energy, and construction

Age of Equipment in German Industry

	1948	1957
0-5 yrs.	18%	43%
5-10 yrs.	37%	18%
10-15 yrs.	14%	14%
over 15 yrs.	31%	25%

have ambitious investment plans. The entire range of consumer goods industries can be expected to come into its own. Late starters like the long-neglected industry of the Saar will require large infusions of capital when the Saar merges with the Federal Republic in 1960.

According to the experts, future capital spending will divide about 50/50 between new equipment and new building; modernization and industry balance will be emphasized in place of the earlier preference for expansion of plant. At least three factors will play an important role in assuring future German expansion:

1. The reappearing German capital market.

2. Rising domestic demand, especially for consumer goods.

3. The influence of the Common Market in Europe. One analysis suggests that by 1970 industrial investment and production for the Six nations will be twice what it was in 1955, and that a third of the increase will come from Germany alone.

FRANCE

Before World War II the French gave little thought to modernization of plant and equipment. But since, the terms "expansion" and "productivity" have taken hold with such power that today it is difficult for a government to brake the economy. Though the boom has been paid for partially by draining away French exchange reserves, the nation finds itself enjoying unprecedented prosperity.

Modernization and expansion during the past four years have raised industrial output to all-time highs; production goals of the government's second modernization plan, ended last year, were in most cases met or surpassed. Productivity is up 30% over 1949 —perhaps the best record in Europe.

But French industry still faces serious problems. First of all, consumption of both capital and consumer goods has consistently outstripped production. The result is a big excess of imports, and a staggering foreign exchange deficit.

Secondly, expansion has drained away the available labor supply and there will be no significant increase in working population before 1961. Finally, tariffs that have kept marginal producers in business will start coming down with the Common Market.

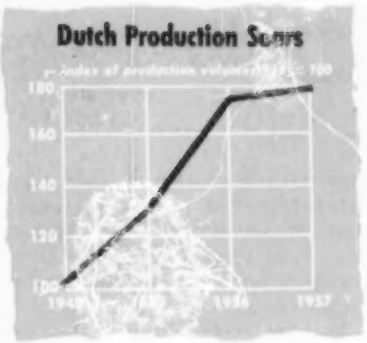
Faced with these three challenges, the French believe that increased productivity is the only solution. A Third Modernization Plan has been drafted, calling for a favorable trade balance and a 25% increase in the national product by 1961. To meet these goals, 20% of the national income must be invested each year in new plant, including housing.

Machine tools, for example, will be needed in great quantity. In 1956, French plants put 61,057 tons of new tools into operation. For 1961, estimates of requirements range from 72,000 tons all the way to 100,000 tons. No one expects the domestic tool industry to meet that demand by itself; so imported tools—which have accounted for 40% of total consumption lately—will continue to be required in volume.

Replacement of old tools is a problem. A survey taken at the end of 1955 estimated that 45% were more than 20 years old. Yet such gross figures hide the modernity of equipment in certain industries: fully a quarter of the tools in auto plants, for example, were less than five years old in 1955.

Overall, French observers insist that most sectors of industry are modern and well-equipped. Dynamic industries like autos (expected to invest 270,000-million francs by 1961), electronics, iron and steel (375,000-million francs for a new modernization program now under way), plastics and petrochemicals have the most efficient plants. Aircraft, agricultural machinery, some textile sectors (206 marginal cotton plants shut down between 1954 and 1956) are lagging.

Prodded by the government's new modernization plan industry should continue to grow more efficient. The Common Market, when it comes, will surely close down the laggards. But this should strengthen the efficient plants—and provide them with a larger labor force to supply a larger market.



NETHERLANDS

After 13 years of rebuilding, re-equipping, and promoting industrial efficiency, the Netherlands can boast a modern production plant, comparing—on a smaller scale—with any in Europe. The record is impressive:

Gross industrial output almost doubled since 1948 . . . Productivity up by 25% . . . Power-tool capacity up from 1.7-million horsepower in 1950 to 4.4-million horsepower today . . . The arrival of 124 subsidiaries of foreign companies (to say nothing of 117 foreign companies entering joint ventures with the Dutch), bringing new products and new productivity to Holland.

Yet Dutch industrialists are determined to continue modernizing. They have to. The main stimulus to investment is the enormous (for Holland) growth of population in a land with few resources. Add to that the competitive challenge of Euromarket. So businessmen are rushing to merge, modernize, mechanize.

What do they need to get ready? One estimate states that Dutch industry must invest 37,850-million guilders in the 1950-1970 period, 21,900-million of it for expansion and the rest for replacement. A shorter-term guess declares that employment for 295,000 persons must be found by 1962, by raising output 21%. At least 21% of the present output of capital goods must go into industrial plant expansion at home.

Large and medium-sized companies in the Netherlands' foremost industries — metalworking and shipbuilding — are well-equipped and up-to-date; they have made heavy investments in the past few years. In 1958 that

PLAN 59 story starts on page 9

investment has slowed, owing to anti-inflation efforts and a suspension of investment allowances. But now those allowances are restored, and spending may pick up.

Meanwhile, for the first time in history, the fast-growing Dutch chemical industry has taken the investment lead. Chemical and petrochemical spending—70% to 80% of it for new equipment—is expected to rise to 400-million guilders yearly. Electronics is another of Holland's glamorous growth industries; Philips of Eindhoven, the dominant producer, invests about 300-million guilders a year. The very important, highly-diversified food processors will require new plant and equipment of between 200-million guilders and 300-million guilders yearly, while textile men have their hands full trying to beat down costs.

SWITZERLAND

The Swiss must make a lot out of little to keep their economy humming. And it does hum. Switzerland has a modern, well-developed industry, acutely aware of the need to keep up to date.

Switzerland's World War II neutrality favored such industries as chemicals and drugs, electric power equipment and textiles. But some of the advantages were counterbalanced as war-devastated European competitors—such as Germany—were forced to rebuild from the bottom up on completely modern lines.

The chemical industry and the large engineering firms are generally keeping pace with development; textiles are not. Leaders of the Swiss watchmaking industry are preparing for sweeping technological developments in the next decade or two, and construction is becoming more and more mechanized. One crucial industry that needs modernization is tourism; many mountain hotels have not been able to find the capital they require.

One Swiss industrialist guesses that road-building and improvement alone will require 10,000-million francs over the next 20 years, and another 10,000-million for waste disposal and water purification. Industrial building and power resources development require 4,000-million francs a year, while new power plants themselves will cost 500-million francs annually. Other capital goods investments are estimated at between 500- and 1,000-million francs a year.

ARGENTINA

Argentina has the oldest industrial plant in Latin America—historically, and in terms of its equipment. The nation's 1,610,000 manufacturing employees work in plants that average 20 years old, with machines that may be 40 years old and still producing.

A new report from the United Nation's Economic Commission for Latin America states that the nation must invest, over the next 10 years, 750,000-million pesos ($41,500-million). Foreign exchange must be found for $3,500-million worth of machinery and equipment imports.

Meanwhile the Union Industrial Argentina has drafted an absolute minimum program of re-equipment over the next few years, to cost $660-million. It does not represent the nation's needs, rather it outlines what Argentina can pay for and immediately amortize. UIA believes that existing machinery can hardly be called obsolete as long as it continues producing. Any new machines would be put to work right next to the old ones, which could always find a host of eager purchasers if sold.

The cotton-weaving industries stand about midway between industries with totally antiquated equipment—food processing, wool—and those in a better position, such as metalworking. Of 950,000 spindles in cotton almost 30% are more than 20 years old, 50% are over 12. Construction subsists on 80% to 90% obsolete equipment—ancient trucks and tractors keep on running. But much of the railroad equipment is inoperable.

Argentina, most observers agree, will have to resume capital goods imports quickly because local manufacture can produce no more than a quarter of the annual requirements. Buenos Aires leaders hope foreign loans, and direct investment, will help out. Otherwise, Argentine production will continue to stagnate (see chart), or completely break down.

BRAZIL

Suddenly Brazil has awakened to find itself the leading industrial nation in Latin America. And it badly needs modernization.

Despite continuing imports of machinery (tool purchases last year were twice 1954 levels), industry has not been able to keep up. Old, inefficient machines are not generally replaced in a booming economy where a sellers' market exists in almost every line, and where consumers have been conditioned to constant price increases.

But there are signs of change. Businessmen are here and there beginning to meet competition and consumer resistance. Maintenance costs are rising, productivity is not. If businessmen are to make a profit, and if—as Brazilians fondly hope—their nation can some day export competitive manufactured goods, they must take a careful look at their methods and machines.

It is characteristic of Brazil that many manufacturers do not get the best out of their plant because of bad planning. Industrial and management consultants often can achieve 20% to 30% reductions in production costs.

Another aspect of the problem is that modern equipment (usually installed next to a machine that may be 40 years old) cannot operate at full efficiency. A new packaging machine may be found in a food plant—but usually works but an hour or two a day. Very

tutional guarantee protecting the grumbles about the debts accumu-

often used equipment from the U. S. A. or Europe seems more suitable in Brazil than the most modern high-speed machinery. But only in special cases can used machinery be imported.

Many machines and tools are being made in Brazil today. But it is still not economical to make a large part of the industrial equipment that is needed. So modernization will have to proceed gradually, in line with foreign currency availability and the flow of foreign direct investment.

The process will be largely unplanned: Areas that need modernization most—such as railroads—will get it slowly. On the other hand, in the area of materials handling (where half the nation's equipment is only five years old) modernization will be rapid because the investment required is relatively small, and the resulting economies large.

MEXICO

The nation's industrial expansion is moving so fast that almost every bit of equipment, however ancient, stays in business. But inevitably, pressures on management to modernize are growing:

1. Competition—in the form of new companies entering business.

2. Rising wage costs are cutting profits.

3. A more quality-conscious market demands better workmanship.

Modernization of Mexican plant is often haphazard—whenever money is available or a good salesman calls. A shop will replace part of a machine; Mexican mechanics are skilled adapters and manage to keep plenty of old equipment working with a new part here and there. Experts believe that the average age of metalworking machinery is 20 years old, and you still see models dating from the 1890s in some smaller plants.

Mexican businessmen say that there is an enormous untapped machinery market in these small plants. If financing could be arranged for smaller loans ($5,000 to $20,000), the flood gates holding back hundreds of millions of dollars worth of orders would open. In the textile industry alone, the cost of complete modernization is estimated at $300-million and beyond.

These opportunities are not lost on some foreign and domestic businessmen. Keep an eye on the possibility of the auto industry blossoming out into local production (as in Brazil), the textile machinery business (where Japanese and Italian firms are going to work), and paper and chemicals (growing fast and demanding more equipment).

JAPAN

Nowhere is the job of modernizing more difficult. But nowhere is it more necessary, and the need for it better understood.

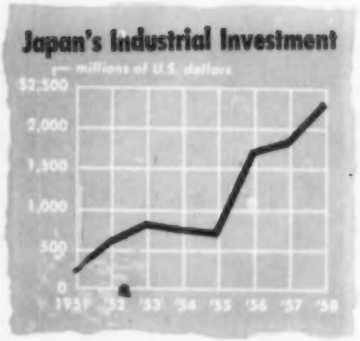
Population growth and a huge raw materials deficit make it essential that Japan recapture her prewar share of world markets. Much has been accomplished. Yet Japan has a long way to go: While industrial production reached about 250% of prewar at the end of 1956, exports stood at 86%.

There are of course many reasons why Japan has not won back its markets. But one of the most important is the relative inefficiency of Japanese manufacturing.

The problem is threefold—involving management, technology, and equipment. The Japanese themselves tend to regard the problem of equipment as all-important—so much so that some foreign observers believe they over-emphasize tools, under-emphasize managerial ability.

But the same observers admit that the core of the problem lies in the structure of Japanese industry. There are two kinds of business organizations living side-by-side. One is the modern industrial sector that has generally kept up with advanced technology. It has invested the equivalent of $9,756-million in the past seven years on plant and equipment. In some areas, labor productivity compares favorably with that of West Europe, and not far below that of the U. S. A.

But right next door are the small antiquated factories—often family workshops—using hand operations instead of machines, paying wages that have little relation to demand in a drastically overpopulated nation. These are the chief obstacles to a construc-



tive program of modernization.

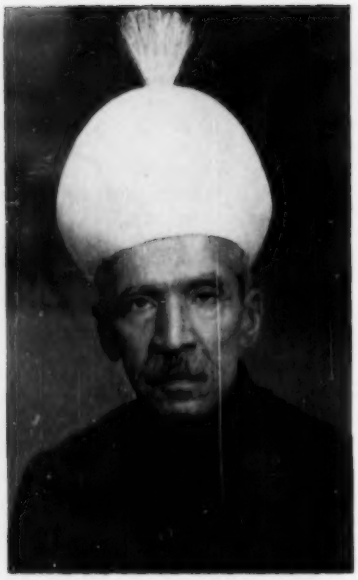
By depressing the wage level, they act as a drag on the introduction of new equipment. And since they supply components to larger industry, they make standardization and quality control difficult.

Nonetheless, the government's modernization plan has made some important progress. And despite the current recession in Japan, capital equipment purchases seem to be continuing at a relatively high rate, though probably below the levels of 1956 and 1957.

Textiles are receiving a steadily increasing amount of new machinery. Some parts of the industry (spinning, for example) rank with the best in the world. Shipbuilding has prospered by combining new capital equipment (much of it made in Japan) with new construction techniques. Large machinery companies are producing high-quality goods.

Machine tools present a problem, however. Total demand last year for tools was the equivalent of $34-million, with imports providing about a third of the total. This strains the economy, and hurts manufacturers who must pay for expensive tools from abroad. Yet by 1960 demand will be close to $56-million yearly, and at least 25% will have to come from overseas.

A second steel modernization program is underway now, to increase blast furnace capacity and reduce the dependence on imported scrap. Japanese believe that the "natural" markets for their steel—Asia, the Middle East, Latin America—are not out of reach, and that their mills are becoming increasingly competitive with European and American steel plants. ●



A Step Ahead Of Tax Men

NAWAB SIR MIR OSMAN ALI KHAN (photo above)—India's richest citizen—is desperately fighting a rear-guard action against revenue collectors—with some success.

His princely powers were taken away from him following India's independence, but he clung to the former title of His Exalted Highness the Nizam of Hyderabad and Berar—and to his vast riches. Today, he is still worth an estimated $1.2-billion in jewels, possibly as much as $450-million in real estate, industrial securities, and trust endowments.

At the time of independence, the Indian government granted the Nizam an annual, tax-free stipend of $1,050,000, to compensate for loss of his privy purse. All was well until New Delhi passed the "expenditure" tax: 100% on all expenditures over $16,800. The government—struggling under the $9.6-billion burden of the Five-Year Plan—hoped to channel some of the Nizam's stipend, and stipends of other princes, into its coffers.

The Nizam, not prepared to accept this, had the case taken to the Supreme Court. He has had the support of another of India's millionaire princes, Gwalior Maharaja. Both argue that the tax violates the spirit of the constitutional guarantee protecting the government's stipends from the Internal Revenue Department.

At the moment, the Nizam is winning a small battle in defiance of the new "expenditure" tax. The department tentatively agreed to sign pacts with the former princes, limiting the tax on stipends.

The Nizam does not fight taxes all the way down the line. He pays taxes on dividend income from industrial securities. The size of these holdings is large enough to raise or lower prices when his brokers buy or sell.

Still, the Nizam is out to pay minimum taxes. Almost all his official residences and part of his jewelry are exempt from the "wealth" tax, but personal taxes run up to 84% for unearned income, 77% for earned income. The government treats capital gains as ordinary income for taxation above the tiny exemption limit of $1,050.

To cut down on his tax bill, the Nizam has transferred $105-million worth of assets into a trust endowment for his dependents—consisting of 3 wives, 42 begums, 33 children, and 46 grandchildren. Besides, he has some 1,000 servants. For their upkeep, he has the stipend, plus a $525,000 yearly government grant to replace loss of revenue from villages formerly part of his crown lands. But New Delhi goes after him even on gifts to dependents—the new "gift" tax ranges from 4% to 40% on handouts above $2,100.

For the Nizam, life in modern India is quite a change from the old days. His Exalted Highness used to control most of Hyderabad, a state the size of Great Britain. Today, he lives in a vast ramshackle mansion set behind massive walls. Forced to give in to republican India, he no longer has a state to rule.

His wealth is also a target of the growing Communist Party. Prime Minister Nehru has formally asked Nizam and other princes to make voluntary cuts in their stipends. A few have, but not the elderly Nizam.

The Nizam has been suspected of salting away some of his riches abroad. But he claims that he is having trouble enough maintaining his mansion in London, and grumbles about the debts accumulated by two of his sons. (*Business Week, Sept.* 20, p151) ●

Natural Gas Heads for World Markets

CONSUMPTION of natural gas outside of the U.S.A. today is moving ahead at a swift and surprising pace. In certain countries, it already is making a significant contribution to energy supplies. Use in the Free World outside of the U.S.A. has increased three and a half fold since 1950—from about 18-million to 63-million cubic meters.

Recent discoveries and development of natural gas in Western Europe has been one of the factors that has focused interest on this fuel. (Consumption here has increased eight fold from 1950 to 1957.) Another factor has been the promising studies of transporting gas by natural tanker.

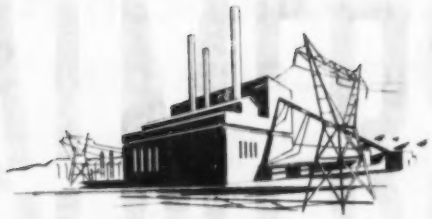
Preliminary estimates show that ocean transport of natural gas will cost about 1.3 cents per 100 cubic meters per 100 kilometers. Though three or four times the cost of hauling oil, the cost is far less than pipe-transporting of gas, which averages about 3.3 cents per 100 cubic meters per 100 kilometers in the U.S.A.

Natural gas to date has crossed international borders by pipeline only between the U. S. and Canada and between the U. S. and Mexico. Plans for a pipeline from the Middle East to Europe have been under consideration for many years, but political obstacles still stand in the way.

Natural gas is far more than a substitute for manufactured gas. Like manufactured gas, it is clean, easy to handle, and requires no consumer storage. It also has higher caloric value than the manufactured product. More energy can be transported through a given pipeline by natural gas.

The U.S.A. has shown the speed with which natural gas use can grow in an expanding economy—at the expense of other fuels. In 1946 natural gas contributed only 13.4% of the total U. S. energy requirements; today it accounts for more than 25%. (*Petroleum Press Service, Sept., p* 336) ●

CONSTRUCTION



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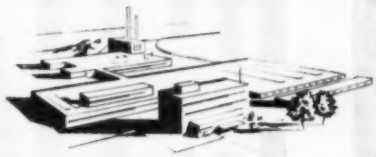

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An American Revolution: The Consumer Says No

"THE CONSUMER is suspicious. He is pausing to evaluate. He feels that he has been fooled and that he doesn't want to be fooled again."

The office worker making this statement summed up the thinking of many a company trying to discover why and how the American consumer has altered his buying habits. For like the car dealer who bewilderedly exclaimed, "We've got a revolt on our hands," all sellers to the American market have been baffled by its recent odd behavior.

For years these sellers have been cultivating certain reliable approaches to the American consumer, whose heavy buying power makes him an especially good customer to please.

Suddenly, these approaches don't work any more. Those who sensed the shift, like the European auto makers and brewers, have benefited by heavily increased sales. But their successful penetration of the U. S. market makes them apprehensive lest another shift in popular taste deprive them of these lush sales.

What evidence points to a change? *Business Week* reporters found these provocative symptoms in a recent 20-city survey of the U. S. market.

European-style cafes with their all-day chess games gain popularity (chess is displacing bridge as a Boston favorite). In Chicago, spectator sports are losing their spectators. But active participation sports — golf, swimming, bowling—prosper. And if your product enhances enjoyment of the home, you're in on the biggest boom of all. All over the country garden tools, picnic stoves, lawn furniture, even whole swimming pools sell as fast as available.

But even with these newly popular products there's a difference. Fad items can't command the outrageously inflated prices they once could. Even boat dealers, riding the crest of a wave of demand, report their customers bargaining hard, beating down prices.

Partly as a result of the protest against ever-mounting prices the "do-it-yourself" movement maintains its fever pitch. But it is stimulated also by an infuriated revolt against shoddy services. A Philadelphian who only recently didn't know one end of a hammer from the other is building his own kitchen shelves. "I wouldn't pay for shelves that would just fall down when you put a match box on them," he snaps.

Puzzled, marketing men ask "What do these trends mean?" In groping for the answers, they have been forced to reappraise their most sacred shibboleths.

In particular, these long-held beliefs about the U. S. consumer must be discarded:

—That he is a sucker for style changes and will not be able to resist your new model if you change its color and contour.

—That he buys prestige symbols and will plunge into debt for your "symbol of success" product.

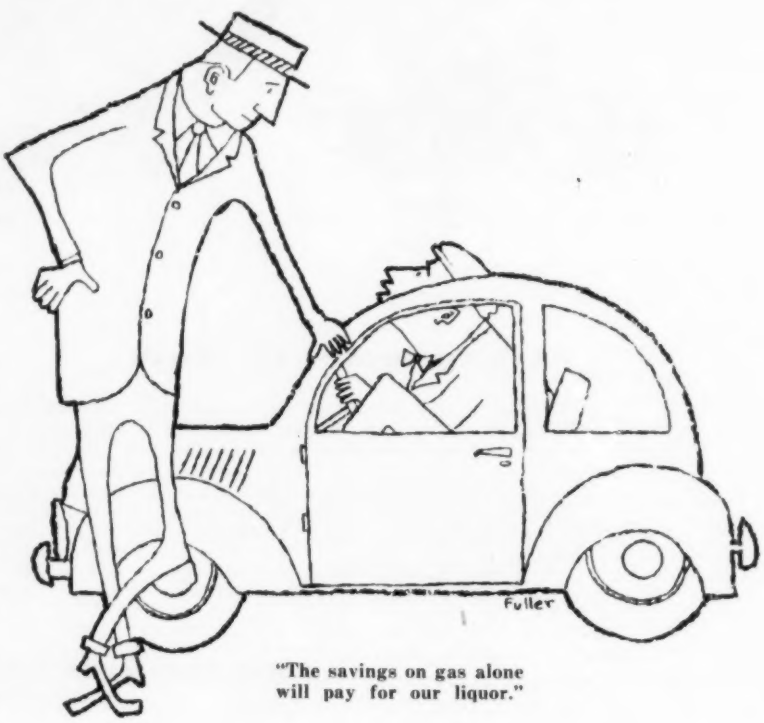
—That your message must be simple, or he will be bored.

With these time-worn prejudices being refuted, the marketing experts have tentatively proposed some explanations, have hesitantly concocted a new set of formulas. They see more desire to lead the good life. As *Business Week* observes, "This doesn't mean a desire for fewer things. But the pride of simple possession is yielding to the urge to get more fun out of those possessions."

Marketing men see the great increase in leisure time as the prime impetus behind the change; people have more time to enjoy the fruits of their abundant spending power. The consumer has time: to explore handicrafts; to pursue the arts; to learn a sport; to cultivate his garden.

It appears in Bostonians refusing to leave their leisurely city for better jobs elsewhere, in Southerners who jot down the names of products they won't buy because of "repulsive" TV commercials. Most of all, it means "a pleasant home where you can do as you please."

The full import of these trends will be developed by the business historians. But for the company selling to his new breed of American customer, the watchword can well be changed from *caveat emptor* —to *caveat vendor*. ●



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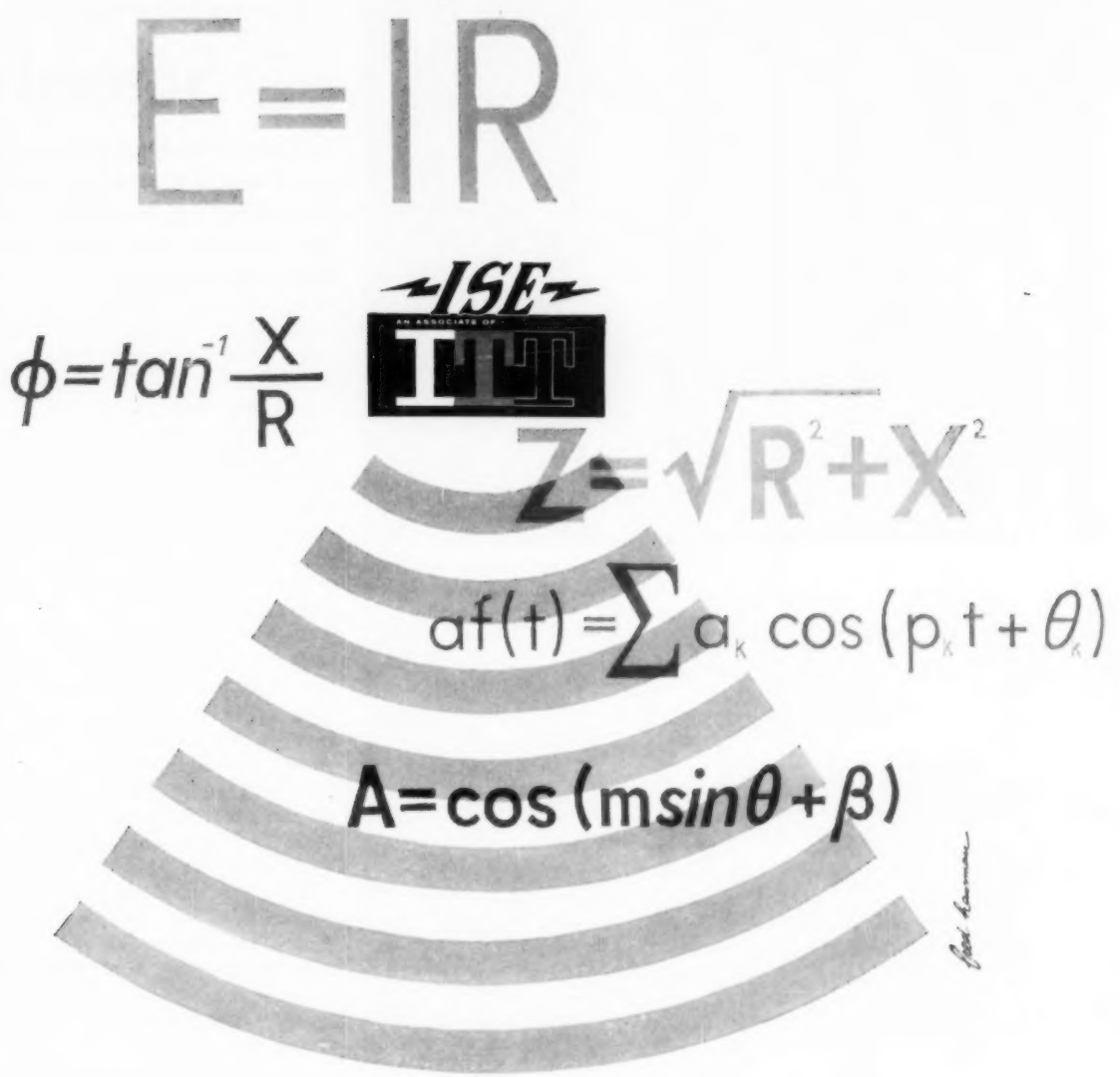

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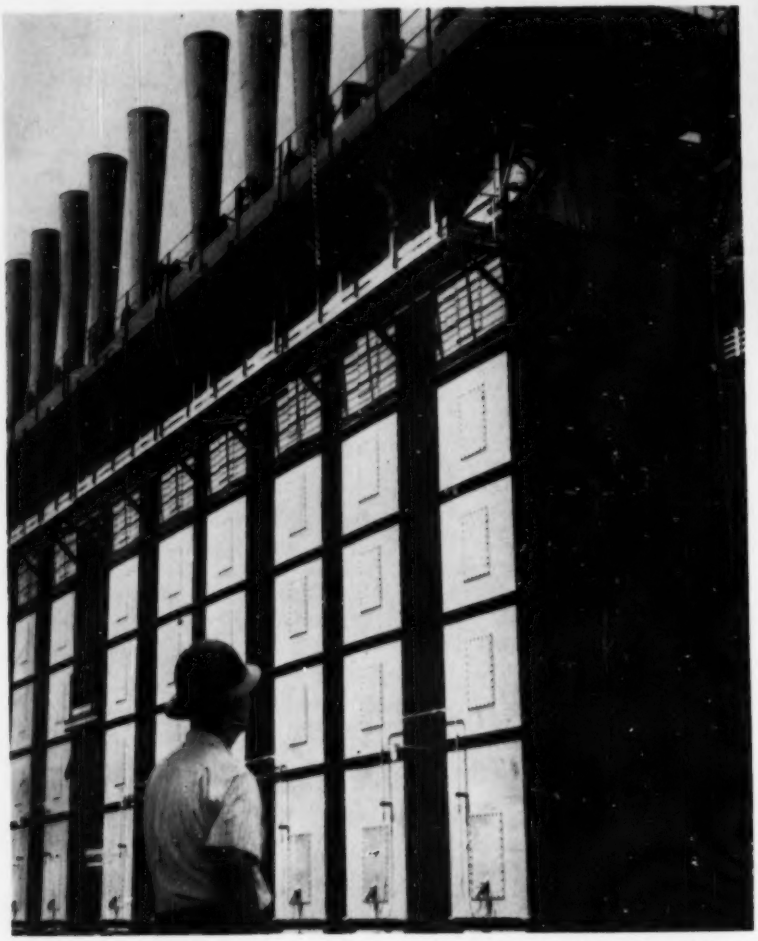
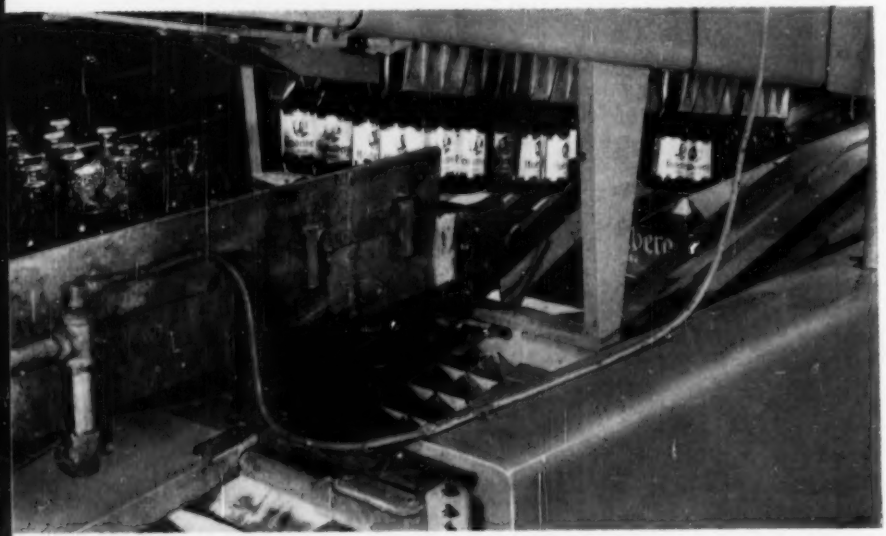
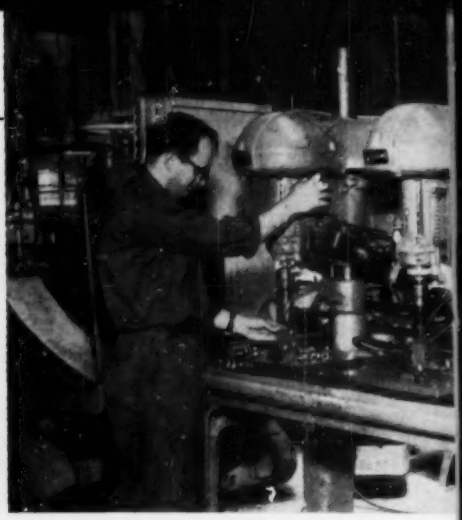


STEEL: Structural steel mills, such as this huge U.S. Steel works rep'acing an older plant in Chicago, take millions of dollars to modernize and keep modern.



FOOD: Time and labor cost are saved and bottle-breakage cut to a minimum by this high-speed uncaser, which has been put to use in a large U.S. brewery.



TOOLS: This row of three single-spindle drill presses, with their automatic feed

Scientific

Tools and machinery today become obsolete at a fast pace—overcome by invention and competition, more often than time and weather.

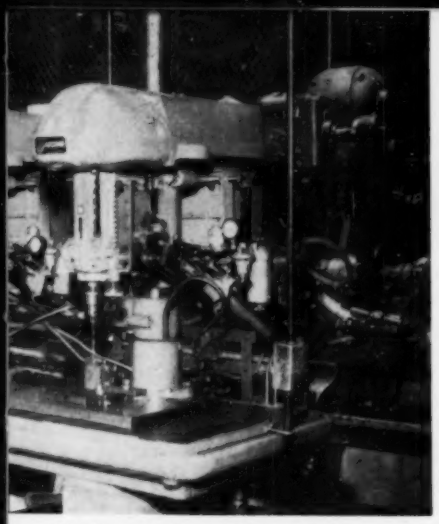
"WHY MUST YOU have a new dress? cries Mr. Top Executive to his loving wife. "Just when my bills are piling up. Give me some reasons!"

The quick-thinking wife could produce three closely-related answers: "Because this dress is in tatters," she might say. "Because it isn't the new style. And because if you don't get me a dress, someone else will!"

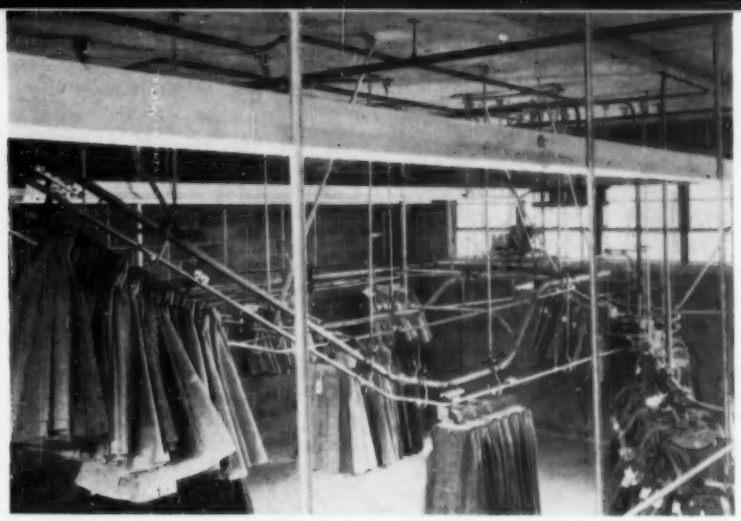
These are the three basic reasons for dressing up your factory or store, as well as your wife. The millions of dollars that will be spent in the next few years in every industrial country of the world (page 9) will be prompted by three inevitables: (1) wear and tear, (2) technical progress and (3) the threat of competition.

In past generations the emphasis was on the first cause. Businessmen replaced their tools, their machinery, their buildings, because they wore out. Wood rotted, metal corroded, machines broke down.

That was in the dim past. Today technological change often obsoletes a product long before it has worn out. This phenomenom is inescapable in our times. Techno-



attachments, is used for drilling centers and wall holes in small bushings.



CLOTHING: Web of monorails, engineered by Dasol Corp., is part of the new Diana Stores Corp. automatic warehouse system described on the next page.

Progress Goads Management On

logical advances are coming at an ever-increasing pace, uprooting old products, old methods, old materials.

"From industrial research," says the magazine *Business Week*, "are coming ideas that are turning equipment into junk."

The business magazine's analysis is made without qualification. New techniques are constantly moving into the factory, and the pace will become swifter in the years to come. Twice as much money is being spent today for research as was spent four or five years ago. The results are imposing and often confusing to individual companies.

Management has no choice but to use the fruits of science and research. Failure to do so invites the third alternative: *someone* will move in and use the new techniques, and step ahead competitively. The new competitor often will have an edge both in product quality and cost, as a result of his modern techniques.

I. Pace Setters

Though all firms are faced with the problem of modernizing and staying modern, the demands differ from industry to industry. The pace of change depends on the type of product, its profit margin, the size of the operation, along with other factors. A huge iron smelter or paper mill cannot be discarded overnight, despite the discovery of revolutionary techniques.

At the other extreme are the industries moving right behind the vanguard of industrial research—communications, electronics, aircraft, chemical. These industries are forcing the pace. They are modernizing day by day, and their dramatic changes have a broad effect on other industries.

Take a look at the airplane builder, for example. His planes are going faster and faster, higher and higher. As they do, he is turning to other industries for better engines, better fuels, better construction materials. Wings must be made to withstand temperatures of 700 C. Instruments, gages and midget motors must behave under a wide range of pressures and temperatures.

Aircraft building, with its close relation to armament needs, has had the advantage of government support in many countries. In the U.S.A., especially, this has enabled aircraft firms to pioneer in related research—metalworking, machine tools, instrumentation. And the demands of the aircraft industry have resulted in technical innovations such as chemical milling, the explosion-forming of metals, electro-erosion cutting.

The communications and electronics industries also have benefited from government spending, and from aircraft needs. And they serve such constantly-expanding consumer needs as television, radio, telephones, office machines.

The demands in these fields has meant swift and unending technical change for electronics. Growth is built on a steady flow of new discoveries and new products. Sweeping innovations take the place of any regular pattern of replacement and modernization.

The chemical industry has stepped into instrument research for much the same reason that aircraft has pioneered in metalworking. Advances in chemistry have spelled out the need for new measuring and control devices. Where instrument makers have not been able to do the development work, the chemistry firms often have shouldered the job themselves.

U. S. chemical and petroleum firms have been spending hundreds of millions of dollars in modernizing their plants. A large share is going into new instruments. Included are such items as continuous analyzers that sample process lines—an improvement in cost and accuracy.

II. Planned Modernization

Many industries cannot move to the swift pace of electronics, aircraft or chemistry. A steel mill, for example, is too huge and too costly to be uprooted by sudden technical change. This is also true, in lesser degree, for other industries producing large quantities of material with a small margin of

PLAN '59

profit—food, lumber, paper, rubber, among others.

Here is where carefully-calculated modernization becomes most important. The advantages and disadvantages of replacing a given piece of equipment must be weighed carefully. The economic soundness of such changes can be tested by various scientific formulas (see page 35). The wise executive blueprints his program far into the future, often allocating a part of earnings for sustained modernization.

One of the largest American firms, U. S. Steel, was forced into such a policy by necessity soon after the end of World War II. During preceding years the firm had been too busy producing steel to think of new techniques and modernization. Postwar prosperity placed heavy demands on its capacity—and obsolete equipment.

U. S. Steel began an organized plan to enlarge and modernize its facilities in different parts of the country. In 12 years it poured over $3,500-million into plant and equipment. Another $1,000-million is planned. Much of this spending is for expansion, but a weighty portion is for new techniques and modernization.

The program has meant a 40% increase in ingot capacity, with some two-thirds of added capacity coming from modernization rather than new furnaces. U. S. Steel has attempted to get the most work out of each of its blast and open-hearth furnaces. Small blast furnaces have been enlarged when they came due for relining. Some of the oldest were completely replaced with larger models.

Other changes saw the replacement of many blowing engines (for blast furnaces) with thrifty turbine-driven compressors.

Larger and more efficient open-hearth furnaces have been developed. They have been aided by better burner nozzles, more efficient fans, larger doors and charging boxes.

U. S. Steel's modernization program has paid off spectacularly, *Business Week* reports. When the program began, the firm consistently earned less per sales dollar than the industry as a whole. Today it earns more than the industry average.

III. Answer to Competition

Most modernization is aimed at increasing the productivity of factories. New techniques also can aid marketing operations, both large and small.

How a medium-sized retailing firm has met this problem can be seen in a look at the new automated warehouse of Diana Stores Corp. Diana sells ladies' and children's clothing at its 208 stores in southern and midwestern U.S.A. It buys, stores, and ships from a headquarters in New York City.

Diana turned to automated handling equipment out of necessity. One of its chief competitors had already modernized. Diana's chance of staying competitively in business was to cut distribution costs—and plan for eventually expanding its outlets.

Diana's automatic handling system consists basically of two sets of electronic circuitry: one circuit controls a web of carrying monorails; the other, a large ascending wheel—like the "ferris wheel" seen at fairs—that moves trays of goods from level to level. The dual-system is directed from convenient control panels.

Incoming goods are counted and then routed electronically by monorail and wheel to the proper floor. Items are ticketed by hand. They are then fed back into the automated system, which seals the packages and routes them to outgoing trucks.

The system makes a new kind of warehouse. It is substantially continuous. Merchandise spends a day less time in the warehouse. There is no confusing movement of many small hand trucks and their operators, no creaking freight elevators.

Operating costs in Diana's old warehouse used to amount to about 7½% of the company's sales. These costs now have been trimmed to 6½%, even though the new warehouse is running at only half its capacity. Diana plans to double its retail stores in the next 10 years. When it does so, the warehouse will run at capacity and offer even greater savings. ●

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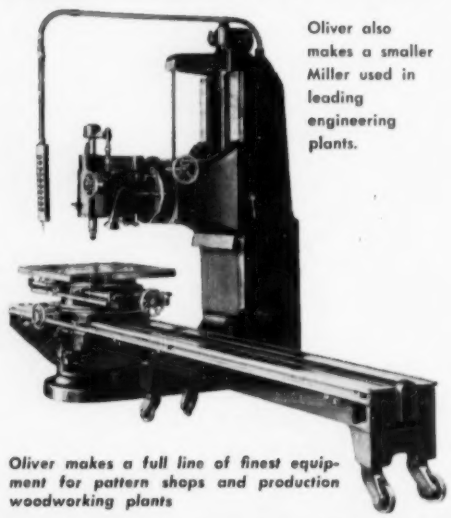

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THE WORLD OVER

KLM

ROYAL DUTCH AIRLINES

PLAN '59

Here are some of the fruits of modernization—documented examples of how small, medium-sized and large companies, located in many countries and producing everything from biscuits to steel, have trimmed costs and increased productivity, proving that . . .

New Techniques Bring New Business

Chemicals in Germany

In Germany—where the modern is commonplace—the Chemische Werke Huels AG. plant at Marl is a showpiece. Between 1951 and 1957, Huels invested a sum of $87-million, equal to three times the firm's basic capital. It used the money for building and equipping two plants for producing raw materials for detergents, a carbon chloride plant, an acrynitril plant, an ethylene oxide plant and a plant for re-processing waste sulfuric acid into pure sulfuric acid.

The plants are automated to a greater degree than any others in Germany, with the sulfuric plant humming along under the supervision of a single employee. The result has been better than a doubling of sales from $60-million in 1951 to nearly $125-million in 1957, accompanied by a comparatively small increase in labor force.

Biscuits in the U. S. A.

Increased efficiency at National Biscuit Co., one of the largest U. S. cracker and cookie manufacturers, has been made possible by plants of new design that are able to utilize the latest equipment and production techniques, according to *Food Engineering*. Since 1946 the company has increased production but consolidated operations into 11 cracker bakeries, from an original 25.

Bulk movement and storage of flour, sugar, shortening and other ingredients, along with automatic handling and mixing equipment, have reduced costs and handling time. Substitution of band ovens for the old reel type, and development of automatic packaging equipment have increased production and lowered unit costs.

As a result of its large modernization program, National's sales increased from $296-million in 1948 to $424.5-million in 1957—a 43% increase. Funds for the modernization program came entirely from operations and working capital.

Automobiles in France

French automobile manufacturers have modernized so fast that they have pulled ahead of the U. S. A. in some respects. Cars and trucks are rolling off the assembly lines at four times the prewar rate.

Flins, near Paris, where Renault turns out its best-seller, the Dauphine, rates as one of the most modern automobile plants in the world. Here steel sheets being stamped into body parts are passed from press to press by steel fingers controlled by electric brains. Even the scrap line under the presses is automated.

Renault put the Flins plant in operation in 1952, doubled its production capacity in 1955-6. Industry-wide, French auto manufacturers now re-invest some 7.9% of their gross income in new plant and equipment. Experts have put a 270-billion franc price tag on modernization for 1957-1961.

Pipes in Brazil

Modernization creates problems and solves them. A Brazilian pipe mill had bought high-speed production equipment that was too fast for its handling facilities. Pipe piled up from the automatic forming and welding mill too fast for handling and threading. Every hour the machine had to be stopped for 15 to 20 minutes.

The superintendent engineer called in a local materials handling expert. A conveyor system synchronized with the pipe mill was installed to take the pipe from the mill's discharge point to a fully automatic pipe threader. Another conveyor carried the threaded pipe to a storage area. The results: higher production and lower costs.

Structural Steel in U. K.

A 161-year-old British metalworking firm, Boulton and Paul Ltd., increased throughput per man from one to nearly five tons with an expenditure of some $176,000 on the drilling plant of its structural steel fabrication works. This meant a capacity raise of $800,000 annually at an annual cost of only $28,000.

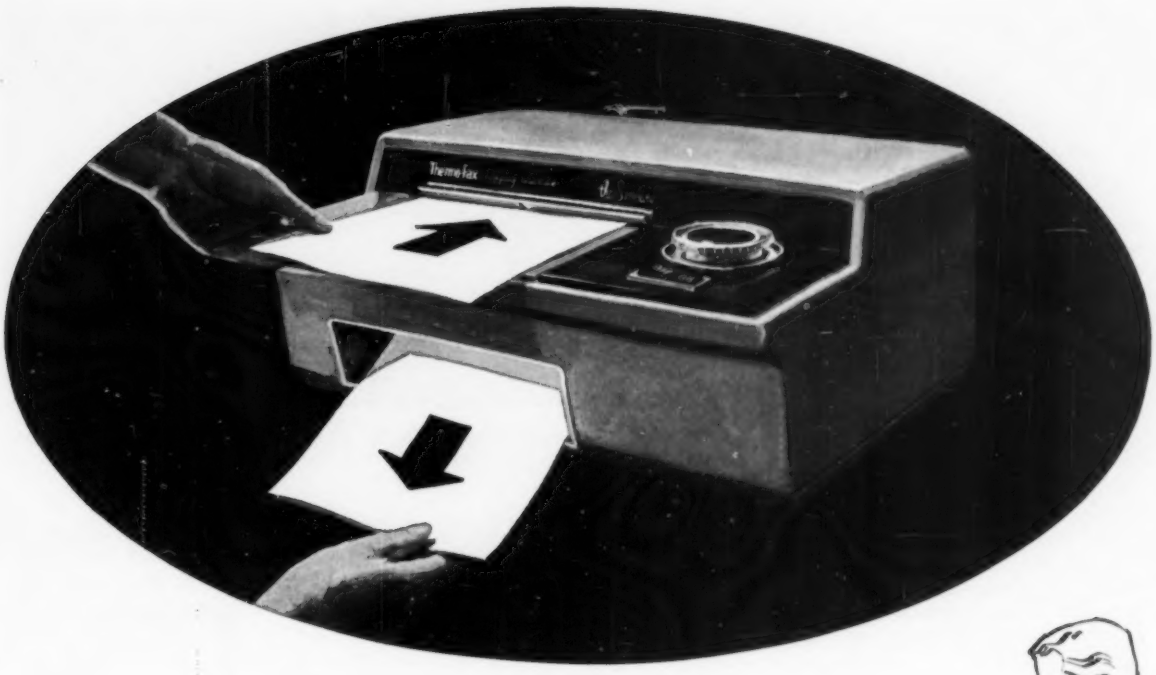
The new installation entirely eliminates traditional methods of handling and marking structural sections for cuts and use of templates for locating drill centers. Roller conveyors carry the steel from stock through cutting and drilling to assembly areas without being touched by operators or cranes.

The project not only improved Boulton and Paul's competitiveness in price and capacity, but put it in a new business. Interest of other structural steel fabricators in the drilling plant has been so great that the company has put a modified version of the original installation on the market.

Men's Suits in Argentina

A two-piece suit made by Argentina's Suixtil—a firm employing about 1000 workers—four years ago was produced in 119.5 seconds; today the same suit is produced in 39.5 seconds. This 200% increase in productivity was brought about by a carefully planned company program of expansion and modernization.

Suixtil began its expansion program back in 1947, when it built a spacious, air-conditioned building, which allowed for future growth. Operations have been modernized at intervals since then. The latest move was in 1954, with a 400% increase in total ma-



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PLAN '59

chinery. This resulted in a novel and efficient placement of workers. Unlike at most clothing factories—where operators face each other—Suixtil workers sit at a 20 degree angle to the aisle. This arrangement minimizes talk, saves space, provides better light and ventilation.

Trucks in Japan

The Japanese have embarked on a drive to secure export markets. To compete in international markets, they must raise productivity and trim costs—through modernization.

Toyota Motor Co. has set the pace in the country. Its main plant in Nagoya is one of the most modern in Japan.

The Toyota plant, built in 1937, began its modernization program in 1951. The program has cost more than $300-million, much of it spent for the latest machinery imported from the U. S.

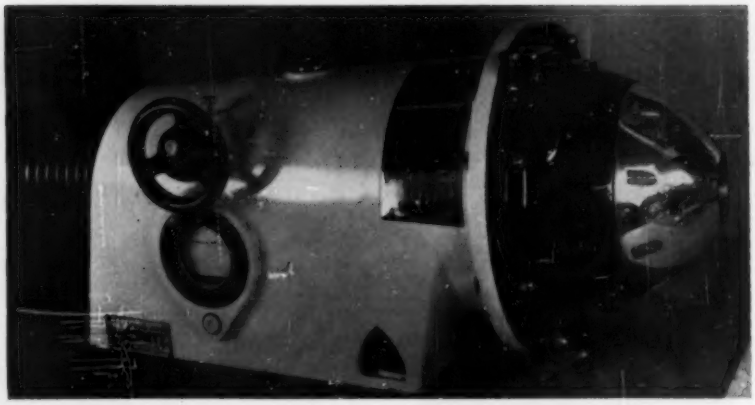
Its success has been demonstrated in productivity: Monthly production in 1951 was 1,000 vehicles. Today monthly production capacity is 7,000. The number of employees in 1952 was 5,200. Today, added production is available with only 5,800 employees.

The plant has facilities for all processes—starting with raw materials, machinery processing, heat treatment, pressing, painting, assemblage of bodies, engines, wheels, and the final assembly of vehicles. It simultaneously produces all types of trucks and buses. Every part of the plant is designed to facilitate changes of models.

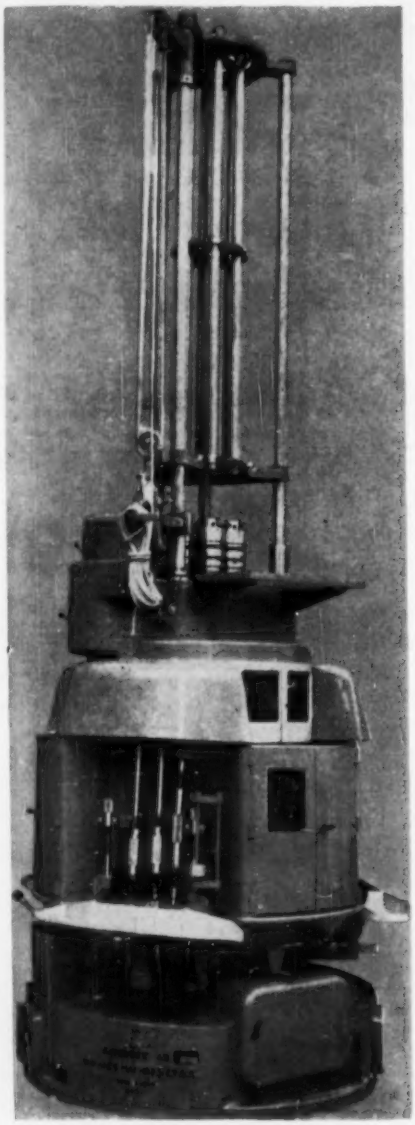
A Grinder in Mexico

A Mexican shop that makes machine tools and vices for hardware stores, Vimalert S. A., has recently purchased new machinery to increase its productivity. An old centerless grinding machine—bought used in the U. S. A.—was replaced with a brand new unit. A job that used to take five hours now takes two.

Many Mexican companies are demanding new equipment like this because of the labor situation. They cannot discharge workers. They hope to raise productivity per manhour with new machines, without raising labor cost. ●



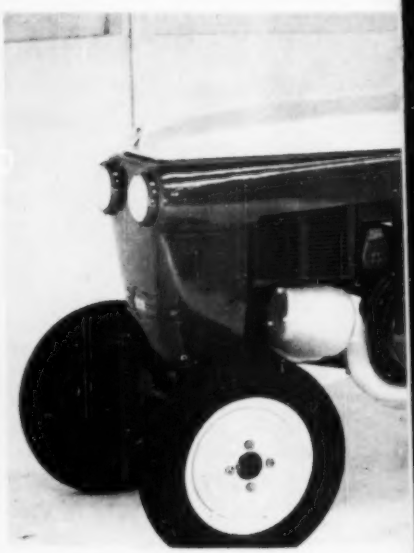
ORE CRUSHER was designed with this sleek and practical housing for the Moritz organization by the French industrial designing firm of Viaud Associates.

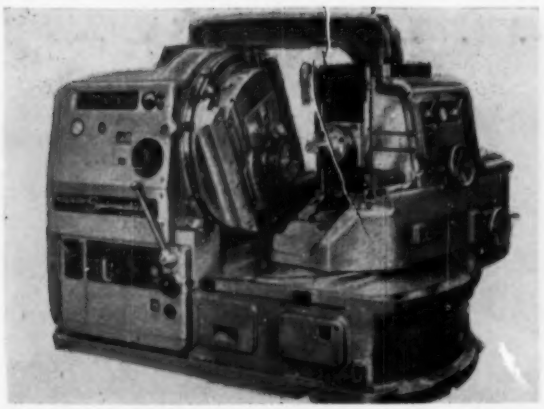


SIX-SPINDLE lathe was designed by its Swiss manufacturer, Tavennes Machines.

European

TUBE of French TV set swivels. By Philippe Charbonneaux for Telavia.





SPIRAL bevel-gear generator combines Swiss precision with good design. Made by Oerlikon Machine Tool Works.

LOUDSPEAKER telephone was designed by Sweden's Hugo Lindstrom and manufactured by the Sinus company.

Designers Combine Beauty and Value

HISTORIANS say that industrial design got started in the U.S.A. in 1932—at the depths of the Big Depression. Today manufacturers in every country are redesigning and modernizing their products. The reasons are many—but foremost are demands of a competitive market.

In Europe, the effort centers on the common market. Manufacturers know that in coming years their products and designs will face the challenge—and promise—of a more intensely competitive market. Only the most daring and creative will prosper.

On these two pages are some of the efforts of Europe's leading industrial designers. They have followed U.S. patterns, but they have also broken new ground. Designers of Sweden and Switzerland, especially, have developed a keen balance between product use and appearance.

"In America," says Sixten Sason, a leading Swedish designer, writing in *Product Engineering*, "the large marketing possibilities and the demand for frequent restyling allows the designer the possibility of making a mistake now and then."

Not so in Sweden, he states. Swedish designs (and those of most of Europe and Japan) must stay more functional and conventional than their U. S. counterparts. They must anticipate the future and ensure more constant value.

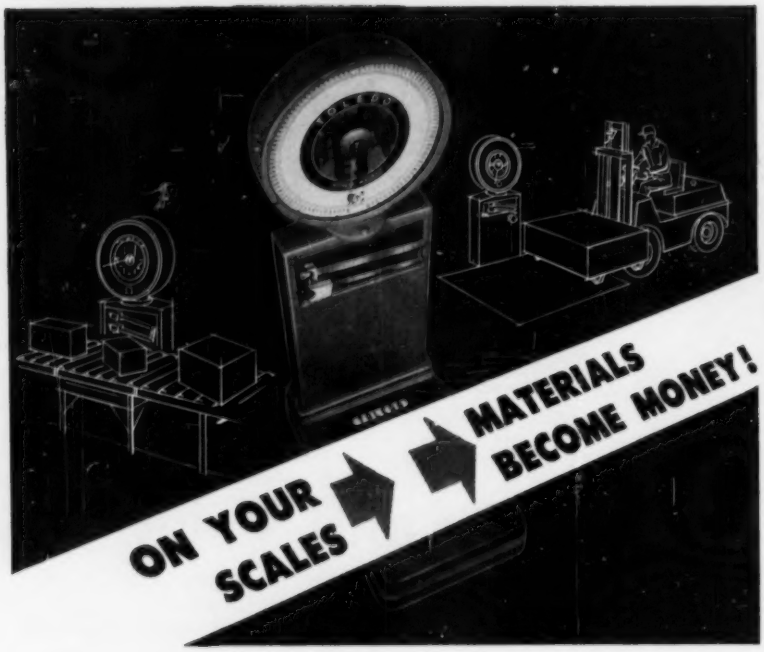
How well European designers have met this challenge can be seen in the surrounding photographs. In consumer goods and industrial tools, beauty has been neatly combined with utilitarian value — versatility, adaptability, ease of maintenance.

The six-spindle automatic lathe for chucking and bar work at far left is an industrial example. Vertical design has meant large savings in space. It also has made possible gravity feed of stock, and reduced friction and wear.

Modern consumer products include everything from the graceful television set (left) to the trim air compressor below. ●

COMPRESSOR, designed by Sweden's Rune Zernell, is electrically powered and self-propelled by air motor. Compressed air is stored in tubular chassis.

TRACTOR (left) was restyled by L'Esthetique Ind. for Soc. Francaise Vierzon.



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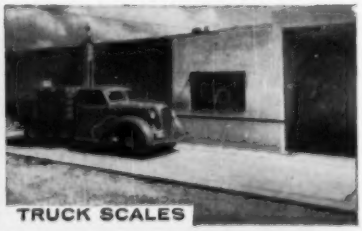
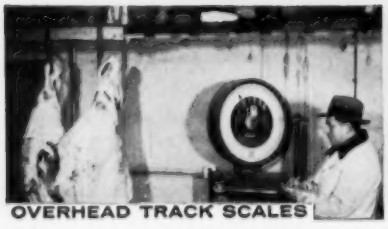
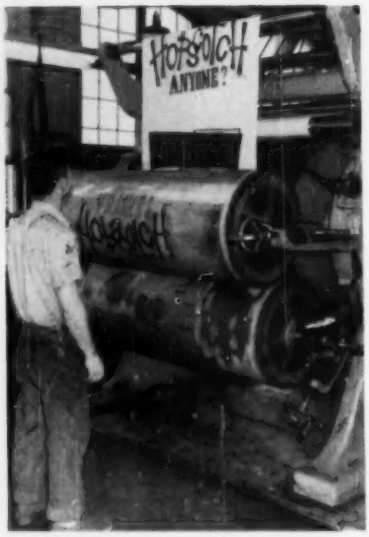

TRUCK SCALES


OVERHEAD TRACK SCALES

COUNTING SCALES

Screen Prints Run Continuously



4-COLOR design rolls off screen.

A NEW screen-printing machine just installed in a U. S. textile plant can produce up to 2,250 meters per hour of four-color prints—a great improvement over normal mechanized screen-printing methods. The machine, the first of its kind in the country, uses cylindrical screens in place of table screens, and prints continuously instead of having to stop and start during operation.

The plant receives its goods—generally heavy fabrics—already prepared for printing, then makes up lots in the usual way.

A typical run for a 180-cm. four-color pigment print on toweling cloth is extremely simple. The material is mounted at the rear of the machine and printed as it travels around the main cylinder. Then it is delivered directly to a slack-type dryer synchronized with the printing press. After a second run, to cure the pigment binder, the job is done. The result is said to have all the brilliance of a table printing job.

The great advantage of the continuous process is its production ability. A typical running speed on toweling is 31 to 36 meters per minute, contrasting sharply with table printing, which averages about 330 to 410 meters per 8-hour day on a four-color print. (*Textile World, September,* p85) ●

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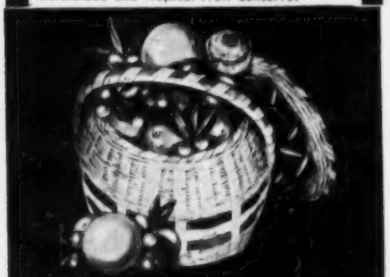
Same as Gift No. 2 except does not contain any delicacies...all fruit.

Gift No. 2 **$9.95**
Approx. 27 lbs.—A pretty Half Bushel Basket filled with fabulous Fruits 'n Jams, delightful to look at . . . delectable to taste! Oranges, Grapefruit, Limes, Kumquats, Tangerines and 3 large Jars of Guava Jelly, Pineapple-Cherry Marmalade and Tropical Fruit Conserve.



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Impact Extrusion Offers...

. . .a technique for shaping finished parts from cold metal. Faster and easier than other methods, it costs less too.

HIGH COMPRESSION PRESSES can take a slug of cold hard metal, ram it against a die, and turn out a perfectly formed part in a second's time. This new use of the impact extrusion process has two vitally important advantages: It eliminates heating or otherwise pretreating the metal to be formed, and it greatly accelerates production.

Extrusion has long been the preferred method for shaping ductile metals like lead and aluminum. But the harder metals presented a barrier to extension of the process.

Impact extrusion or cold flow pressing, as it also is called, demands exceptionally tough punches and dies. And it calls for powerful rigid presses that can exert pressures of 150 tons or more per square centimeter. Metallurgical advances have supplied the materials to make the resistant punches and dies, and high compression presses are available now in Germany, Britain and the U.S.A.

Impact extrusion already is invading the small components field, where its one-step operation outmodes conventional techniques.

Fastenings for the automotive industry require exactly the sort of characteristics that the process offers. Staggering amounts of these small components must be produced as fast as possible—yet each one must conform to exacting tolerances. Impact extrusion can turn out the vehicle industry's specialized gudgeon pins, bearing cups and bolts faster than the former multi-process methods of heating, turning, milling or grinding. And it turns out a superior product.

Users have discovered that the extruded product has greater fatigue strength than parts formed by machining methods. A result of better grain structure, this increased strength gives manufacturers the option of producing a more durable product or of using less costly grades of metal.

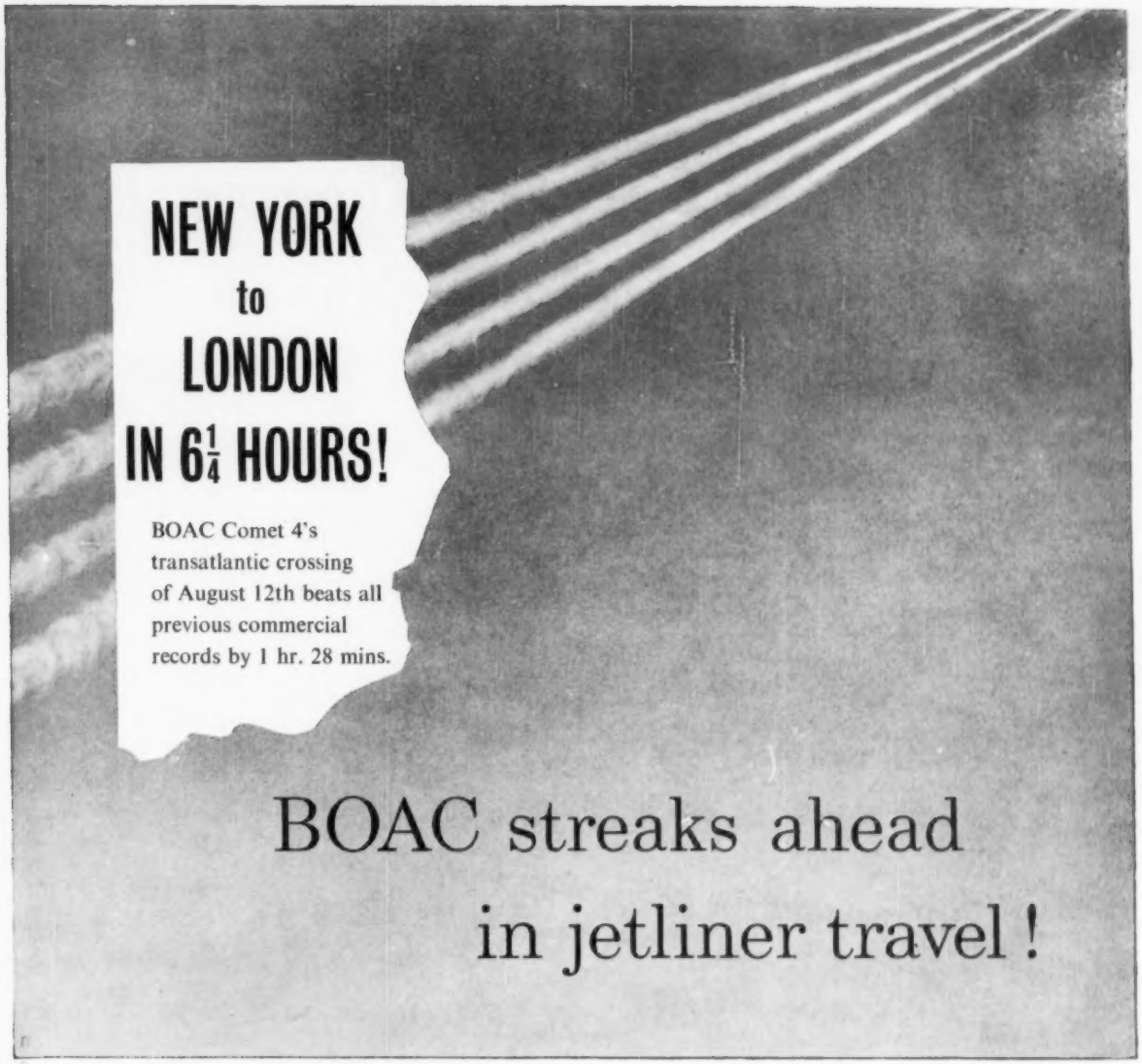
Impact extrusion trims costs in other ways too. Waste and scrap are practically eliminated, because extrusion uses only the exact quantity of metal needed. And the piece comes out of the press with no excess material to be machined off.

Skilled machinists, those highly paid operators who finish a part to exacting specifications, can be replaced by inspectors—and one inspector can operate several extruders. Even inspection is reduced since the process guarantees a precise product when working properly.

Especially for a smaller firm, the versatility of impact extrusion machinery can offer significant savings. The great bulk of the investment in an extruder goes into the highly adaptable press; to produce different parts, you merely change the expendable punches and dies. This feature makes the extrusion process feasible for short run work. The press can fashion some rather intricate parts too. Designers can chose from: forward extrusions, where the metal fits in and around the dies; backward extrusions, where the part fits around the punch, combinations of both types.

Successful impact extrusion necessitates greater attention to preparation of the raw material. The slug of hard metal should be cut from bar stock conforming as nearly as possible to the dimensions of the end product. Proper lubrication is of paramount importance. Contact between the slug and punch can cause a breakdown; therefore raw stock should be dipped first in an etching solution, then coated with a lubricant.

The greatest drawback to impact extrusion arises in the heavy capital outlay for a high pressure press. Yet the advantages cited above point to a much faster amortization than on conventional metal-forming equipment. And the experience of an American auto firm indicates healthy 30% to 40% savings from switching to the impact extrusion process (*Business, Sept., p 76*) ●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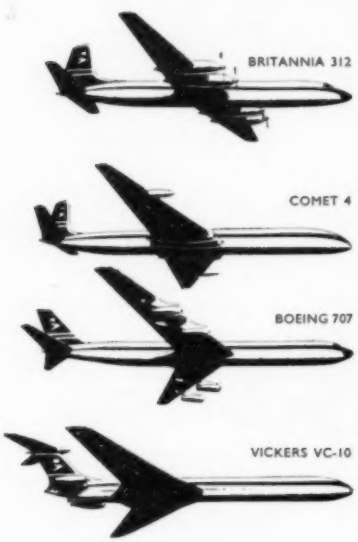

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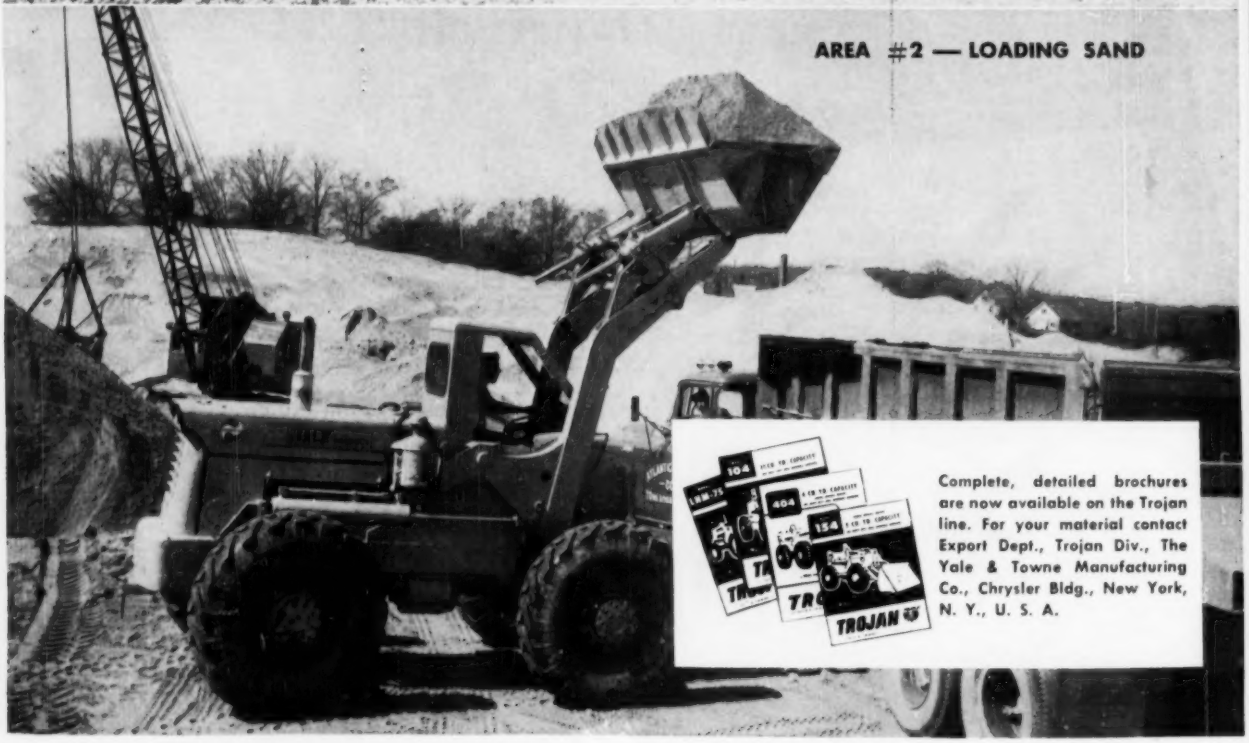

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Technology

X-Ray Television Is Super-Bright

A television X-ray system recently developed by U.S.A.'s General Electric Co. can put an image on a screen that is 10,000 times brighter than a conventional fluoroscope. The system consists of three basic units—the X-ray sensitive camera, a control unit, and the viewing monitor. The monitor magnifies the image electronically up to three times its actual size. (*Product Engineering, Sept. 29, p 23*)

New Powder Makes Superior Emulsifier

A water-soluble synthetic polymer—Carbopol—soon may be making life easier for manufacturers of pharmaceuticals, paints, waxes, printing inks, and a wide variety of other new and old products. Recently out of the laboratories of B. F. Goodrich Chemical Co., U.S.A., the white fluffy powder is said to be "the most versatile agent ever discovered for thickening, suspending, dispersing and emulsifying." Demonstrating the new product in New York, Goodrich's L. R. Modlin dropped a spoonful of Carbopol in a tube of water, and then was able to suspend two golf balls in the thickened solution. (*Purchasing Week, Sept. 22, p 22*)

Ore Reduction with Natural Gas

A new process for making sponge iron from iron ore by reduction with natural gas has been developed by Fierro Esponja, S.A., Mexico, with the engineering aid of The M. W. Kellogg Co., New York. The process uses special techniques of gas reforming and heat recovery, which insure high thermal efficiency. Either natural gas or petroleum can be used for the reducing medium. The 200-ton-per-day Mexican plant uses sulfur-free natural gas produced in Kellogg high-pressure steam reforming furnaces. A larger plant is planned. (*Chemical Week, Sept. 27, p 61*)

Novel Method of Packaging Instruments

A U. S. oil-well surveying firm has turned to using urethane foam for packaging its delicate instruments. Packing the instruments in tailored sections of the plastic has meant savings in reduced breakage and assurance that expensive items will arrive in operating condition. Urethane packaging has also reduced shipping weight.

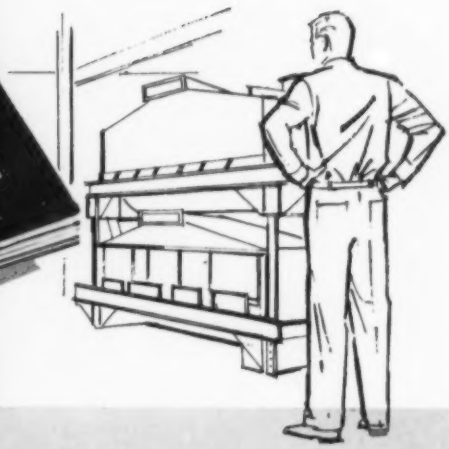
Ship Propellers Get Some Research Attention

The movement of a ship's propeller is constantly held back by the formation of tiny bubbles on its blades. The U. S. Navy's Office of Research now has come forth with a propeller design that it says does away with "bubble drag" and can end up with ships that travel through the water at 60 to 70 knots (some 110 to 130 kilometers per hour)—almost twice the present top speed. Submarines and hydrofoil craft using the new propellers, the Navy says, may cut through the water at the fantastic speed of 150 to 200 knots. (*Business Week, Sept. 6, p 35*)

Coal Moves Through Long-Distance Pipeline

A 170-kilometer pipeline in Ohio (U.S.A.) has been transporting 100,000 tons of coal a month for the past two months, and experts are amazed at its efficiency. Engineers now are studying the possibility of moving shale in the same manner. The Ohio system has three parts: a preparation plant, the pipeline itself, and a plant for dewatering the coal slurry at its terminal. (*Petroleum Week, Aug. 22, p 38*)

DRYING GRANULAR MATERIALS?



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Management's Role in Modernizing

Long-range planning is needed. Also, an accurate formula for evaluating when equipment should be replaced is needed.

MAKING INVESTMENT DECISIONS for replacement or modernization is probably the most backward management area today—because it is the most difficult and the least understood.

Even sophisticated managers tend to speak of modernization in the past tense: "We modernized two years ago" is a frequent reaction. The job is never-ending.

A modernization program should be continuous. It should be systematic and well-organized. And it should be directed toward the customer, on one hand, the company treasury on the other. Many companies now have a man who specializes in replacement problems.

Even the best plans can go wrong, to be sure. A new product from a competitor can make a project obsolete even before completion. A more usual result, as noted by one executive: "We see many a unit that was projected for 15 years being replaced after five or six." And there is the opposite viewpoint: "If our plants are not obsolete in 15 years," observed a foundry manager, "our research is not doing a good job."

The most difficult problem, however, is the one behind the plans: How can you calculate the worth of a modernization project?

Many managements still use what might be called the "Neanderthal approach" to modernization. One day an ancient machine refuses to turn over. The shop boss kicks it, and still it refuses. So he sells it for scrap. And that is probably all that management knew of why they bought a new machine, and whether it was sensible to do it.

On a higher plane, managements make use of "rule of thumb" approaches which do call for facts and figures.

I. Payout Period

One of these approaches sets out to establish the "payout period" of an investment in new equipment. Its great lure is an apparent simplicity and conservatism. It tells—or would tell if it were properly computed, which it usually is not—how fast a company can get its money back out of an investment in a machine, an asset that will deteriorate year by year.

Suppose that President Alpha of the Omega Machine Co. is thinking about buying a new automatic screw machine, costing $15,000, to replace a 30-year-old machine. He has analyzed his business and found that the new machine will save him $5,000 a year, before taxes, in operating costs.

So he considers the payout period to be three years; assuming a tax rate of 50%, then six years. Depending on what other factors he considers—depreciation allowances, salvage value, interest costs, etc.—he will get another answer.

But if his object is to make sure his company recovers the original cash outlay as quickly as possible, any answer he gets will be largely meaningless.

The important question is not how fast funds will flow into the company's treasury. What matters is how much the investment will yield beyond the payout period.

II. Rate of Return

To avoid the pitfalls of the payout period, some companies try the reverse approach. They seek to base their decisions on the rate of return of a new investment.

Here is how Mr. Alpha, of Omega Machine Co., would try this system on his $15,000 automatic screw machine.

"The new machine will save me about $5,000 a year in direct labor and maintenance costs. But I have to figure my depreciation allowance on it, and on the basis we are on, I can write it off in 20 years. To round it out over the 20 years, I will take off a standard $750 a year for depreciation. That means the return to me is $4,250 a year.

"I will still have my income tax to take out—say 50%. So if I buy the machine I will net $2,125 a year more than if I don't buy it.

"Since it costs me $15,000, I will be getting a rate of return of 14%. And that sounds pretty reasonable."

But is it reasonable? Probably not, for this system is almost as faulty as the payout system.

To be sure, many companies do make use of cash recovery standards. A recent survey of U. S. companies turned up a widespread expectation of 20% to 30% on equipment with a service life of 10 years or more—a payoff in five years or less.

Controllers say they often use cash-recovery calculations as a rough screening for capital spending proposals, and for projects where obsolescence is difficult to determine. Cash recovery standards usually depend on the premium put on cash.

Calculating the payout period can teach another important lesson—that with antiquated equipment, returns come in quickly on whatever is spent on new equipment. A high rate of return usually means that management delayed too long.

III. Critical Flaws

Both of these methods—payout and rate of return—suffer from two critical flaws:

—Neither helps find the real worth of the project. Too many factors are overlooked.

—Neither compares the cost with the present value of the anticipated earnings—or with the yields from possible other projects, or with possible advantages from delaying the modernization project.

When a businessman buys a new machine, he is, in a sense, buying an annuity that consists of the income he expects from the machine. The investment is good only if the capitalized value of the annuity is greater than what he pays for the machine.

What management needs is a better way to estimate the value of that "annuity." For one way . . .

PLAN '59

Modernization by Formula

Simplified "MAPI" formula makes it easier to judge the worth of a modernization project.

NO FORMULA can tell a company whether it can keep selling its products, whether economic conditions will be good or bad, whether competitors are about to sweep it off its foundation with new products.

The businessman still has to work these things out for himself when judging a modernization project.

So the question for management is not, "Can I get really accurate forecasts by using a complex investment formula?" The real question is, "Is there a sensible and efficient way—complex or not—to estimate the worth of a project?"

What the businessman wants is a guide to the time when the return from an investment is greater than the cost of the capital he will have to use, the return he expects from such investments, and the returns available from other investments.

I. The MAPI Formula

An increasing number of major industrial companies are turning to a formula developed by the U.S.A.'s Machinery & Allied Products Institute (MAPI). Anyone seriously interested in this problem will need the manual published by MAPI (Business Investment Policy, $10, MAPI, 1200 18th St., Washington NW6, D. C.)—the MAPI formula cannot be fully covered in this brief report. The manual is designed as a sort of "do-it-yourself" investment analysis kit for businessmen, engineers, and accountants. And MAPI reports considerable interest from Europe, Latin America, and Asia.

It is well to remember that MAPI's formula works best in multiplant companies. One U. S. company, Allis-Chalmers Manufacturing Co., has used the MAPI system for several years, and it made post-audits in 1956 and 1957. Plant-by-plant, there were fairly wide variations between the MAPI estimates and the post-audit. But the variations averaged out over seven plants, and the difference between the MAPI estimates and the money the company actually gained was approximately 6%.

The MAPI formula was developed by economist George Terborgh, research director of the Institute, in 1949. Since then he has been working to make it more effective—but more simple too.

The MAPI formula aims to produce a figure called the "next-year rate of return." This is the return you will get from new equipment if you buy it now, rather than waiting one year.

A common fallacy is to compare the expected returns from the entire service life—say, 10 years—of a new machine with what it would cost to run the old machine over the same period. This leads to wildly unrealistic estimates.

The company that uses MAPI's technique has to sort out five different factors that go to make up that "next-year rate of return." These factors are the operating advantage of the new equipment, capital consumption avoided, added income taxes, the cost of consuming the capital, and the net investment in the project.

First of all, everything depends on management's forecast of the operating rate of the new machinery. This factor underlies all the estimates of earnings and costs —and MAPI cannot help you work out the most probable operating advantage. This can involve everything from labor and maintenance to inventory and product quality.

II. Charts Make it Easier

But where MAPI makes its greatest contribution is in working out a project's first-year capital consumption cost. Toward that end Terborgh and his colleagues have produced a set of standardized charts. The charts are based on several assumptions that are considered normal for most companies—a 25% debt ratio, a 3% interest rate, a 10% after-tax return on capital.

There are three charts, representing the three general patterns in which the earnings of a new machine will decline over the years of its service life. In some cases, the machines will produce half their earnings by the time they have worked half their service life (chart on the right).

In other cases, the machines will run off their earnings faster or slower: Another MAPI chart is based on a one-third run-off in the first half of service life, the other on a two-thirds run-off. Terborgh believes these three patterns cover all but the most unusual cases.

Selecting the proper chart to use is simply a matter of matching the characteristics of the machinery to the closest of the three patterns.

Remember, however, that MAPI's curves—on all three charts—are tailored specifically to the tax depreciation methods authorized by U. S. law—straight-line, double declining balance, and sum of the years' digits. Users elsewhere are advised by MAPI to select the depreciation curve that is closest to their own. They would then come up with what Terborgh calls an "approximate" solution. He says there would be no significant difference from the solution an American company would get.

Income tax rates present no problem. The curves are calibrated for a tax rate of 50%; but MAPI provides tables for converting the results to any tax rate below 50%.

It is well to note, too, that the state of development in a country —and the labor situation—has no bearing on the use of the MAPI formula. And the technique can be applied to used equipment as well as new.

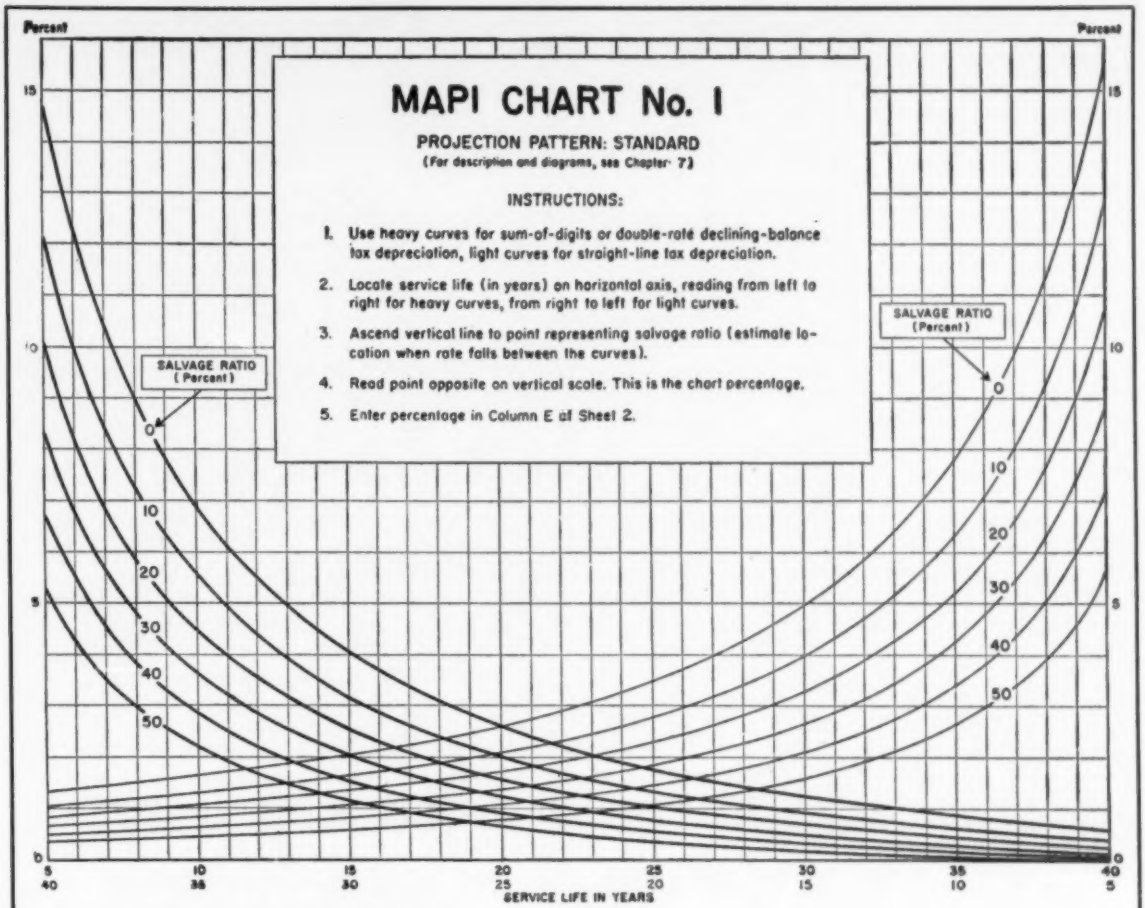
III. The Other Factors

The capital consumption avoided, one of the five basic MAPI factors, is the expense needed to keep the old machinery running for another year, at least part of the cost of overhaul, and loss from lower salvage value.

There may be extra income tax, as the result, for instance, of selling the old machinery. This must be subtracted from the gains.

And the fifth big factor is the net investment in the project. This

continued overleaf


MAPI CHART No. 1
PROJECTION PATTERN: STANDARD
(For description and diagrams, see Chapter 7)
INSTRUCTIONS:
1. Use heavy curves for sum-of-digits or double-rate declining-balance tax depreciation, light curves for straight-line tax depreciation.
2. Locate service life (in years) on horizontal axis, reading from left to right for heavy curves, from right to left for light curves.
3. Ascend vertical line to point representing salvage ratio (estimate location when rate falls between the curves).
4. Read point opposite on vertical scale. This is the chart percentage.
5. Enter percentage in Column E of Sheet 2.
Percent
SALVAGE RATIO (Percent)
0
10
20
30
40
50
SERVICE LIFE IN YEARS

How the MAPI chart works . . .

President Alpha of the Omega Machine Co. wants to know whether or not to buy a $15,000 automatic screw machine. After analyzing all his cost and operating data, he pulls out his MAPI charts and worksheets (see text left for full explanation):

Operating advantage: President Alpha estimates that $5,000 would be saved in the first year from cost of direct labor, maintenance, etc.

Capital consumption avoided: Overhaul of the old machine would have cost $4,000. Pro-rated over 10 years, he will save $400 the first year by not putting money into the overhaul job.

Income taxes: From the total of the above two figures—$5,400—income taxes must be cut. Assuming a 50% rate, that leaves a next-year after-tax advantage of $2,700.

Capital consumption costs: Now he turns to the MAPI charts. He estimates that he will get back half of the potential earnings by the time the machine's service life is half over. That means he uses the No. 1 chart shown here.

He also estimates that the new machine has a 20 year service life, and that he will get back 5% of its original cost when he finally sells it. He uses the "sum of the years' digits" method of depreciation. This is all the information he needs to use the chart.

He picks out the approximate point on the chart and runs a line to the edge of the chart. The answer: 2.3%.

He then multiplies the $15,000 by this figure, and gets $345. Subtracting this from the after-tax advantage of $2,700, the advantage becomes $2,355. Now before going on, he needs . . .

The net investment: The total cost of the new machine is $15,000. But salvage will account for $300, and tax on the sale will be, say, $75. And it would have cost $4,000 to keep the old machine operating. Subtracting these figures, the result is $10,625.

Next-year rate of return: What percentage is $2,355 of $10,625? This is the last step. And the figure is roughly 22%.

President Alpha can test this figure against his "cut-off rate"—the return he demands—for this type of investment. He can also use it to compare this project with other investment opportunities.

He can also calculate the payout period with far greater accuracy than with conventional methods. With a return of 22%, the payout period for the project is obviously between four and five years.

PLAN '59 is a simple matter of arithmetic. From the total cost of buying and installing the new equipment, subtract the salvage value of the old and the capital consumption avoided.

For a demonstration of how MAPI works, see the example.

It is possible also to work out the same problem using the same basic theory, but not using the MAPI formula. Joel Dean, an economics professor and president of his consulting firm, Joel Dean Associates, has developed the technique of building a complete, tailor-made projection for the operating gains of each separate project. He sets up a timetable which shows the effect the project will have on the cash flow of a company for each year of the project's duration. The crux is to make reasonable estimates of the cash inflow and outflow for each year.

The basic difference is this: Where Dean custom-builds forecasts, MAPI puts them on a mass-production basis.

What About Depreciation?

"THERE HAS BEEN a growing realization in recent years of the importance of depreciation as a source of capital funds," says MAPI's George Terborgh.

Many management men have become convinced that modernization should be financed through depreciation allowances. Otherwise, funds must come from tax-paid income, or expensive outside sources.

The realization has come to governments, too. Everywhere, tax allowances have been liberalized. The basic reason is simple—inflation. Another motive is to encourage capital investments.

Liberalization takes two directions: Historical costs are adjusted toward current values; or the recovery of historical costs is speeded up. A few countries have adopted both methods.

Resistance to abandoning the historical-cost basis is strong. Terborgh contends that it has taken an inflation of 200%—a trebling of prices—or more to break down the resistance. "With a need so compelling," he comments, "technical difficulties and accounting conventions are brushed aside." France and Italy, for two, thus "grasped the nettle."

But a price adjustment alone discounts only past inflation; it offers little protection against future inflation. For that reason, Terborgh says that faster recovery "seems definitely superior" to price level adjustments as an incentive to invest.

Faster recovery is effected in many ways. To cite a few:

—Britain adds 25% to normal depreciation rates, plus a special write-off of 30% of equipment costs, 15% of buildings.

—West Germany and Canada permit the recovery of over 50% of most equipment costs in the first three years of asset life.

—Sweden allows a complete write-off over five years, with 70% recovered in the first three years.

—The U.S.A.'s double-declining balance method returns about 66% in first half of asset life; the "sum of years' digits" method (sum for 10 years: $1 + 2 \ldots + 10 = 55$; so allowance is 10/55 in first year, 9/55, 8/55, etc.) returns about 75% in first half of service life.

Even so, the depreciation rate is seldom high enough to fully counteract inflation. Terborgh figures that the U.S., for instance, with an annual inflation averaging 4% over the past 25 years, should have allowed a declining balance rate of at least three to four times the straight line rate.

The individual company must make the best of a bad situation. One American company set up a special reserve account to cover the difference between original costs and replacement costs. It still pays profit taxes on the reserve; but internally, the company treats the reserve as a legitimate expense.

Sources: McGraw-Hill World News; Business Week, Sept. 27; Food Engineering, Oct.; Purchasing Week, Oct. 6; Factory Management & Maintenance, Nov.; American Machinist, Oct. 20; MAPI's Business Investment Policy ($10), The Tax Depreciation Problem ($1).

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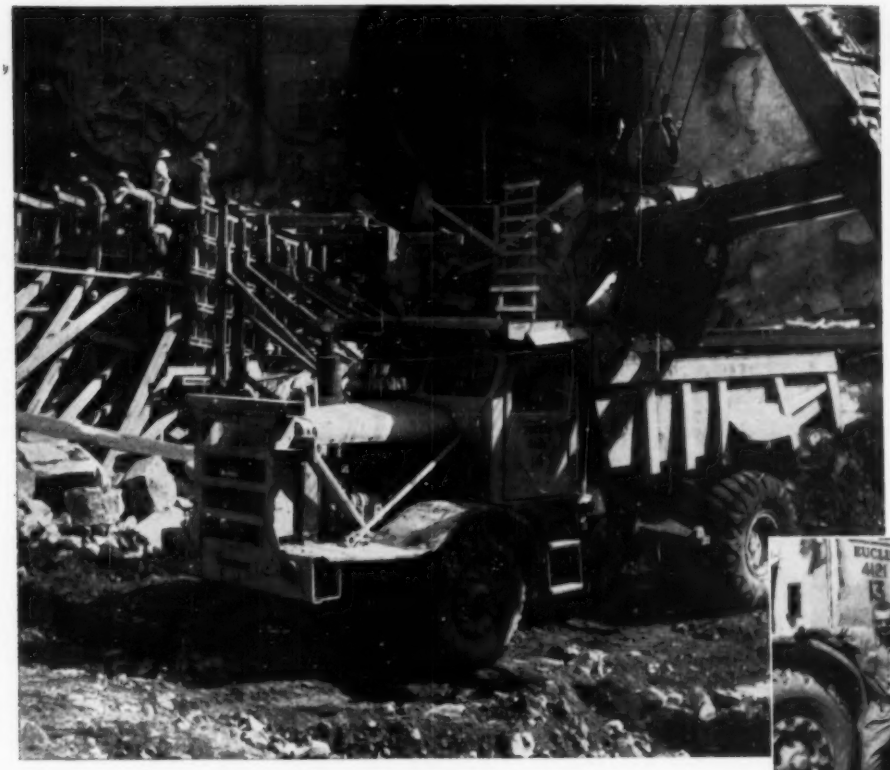

Left to right: Blair Coleman, Ass't. Mech. Supt., Jack Bellafontaine, Mech. Supt. and C. R. Robins, Construction Mgr. for Angus Robertson Ltd.

"Eucs" help build rock-fill dam in PAKISTAN

A big hydro-electric project now under construction at Warsak on the Kabul River will generate 180,000 kilowatts of power for West Pakistan. It will also provide irrigation for 120,000 acres of barren land when completed.

Angus Robertson Ltd. of Montreal, Quebec, one of Canada's leading contractors, is using 27 Rear-Dump Euclids to move the big tonnage of earth and rock. Fifteen of these have 22-ton capacity and 12 are rated at 15-tons pay·· ·d . . . all are British built and are powered by Rolls-Royce diesel engines.

The "Eucs" are working on all phases of the project . . . coffer dam, tunnels, pen stocks and rock-fill for the 240 ft. high dam. They carry full loads over difficult haul roads with grades up to 27%. Mr. C. R. Robins, construction manager, states that schedules would not have been maintained without the Euclid fleet.

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What Kind of Training for Foremen?

A training program, to be successful, must meet actual needs. Here is how improvable areas were identified in a U.S. enterprise—as a by-product of a performance rating system.

THE CRUX of setting up a foremen training program is to find out what kind of training the foremen actually need. A training program without a clear purpose is probably worse than no training program at all.

To be sure, there are many worthwhile sources for selecting the subject matter for training courses. The recommendations of training experts, job analyses, opinion and attitude surveys, employee suggestions, the results of testing programs—all can contribute to the agenda.

But one source that is seldom used, and one that could contribute valuable information: the performance rating systems that are widely used in industry in various forms. Why? Probably because few rating schemes give sufficiently detailed information on the strengths and weaknesses of the employees rated, in the opinion of business consultant W. Dudley Waite of the U.S.A.'s Richardson, Bellows, Henry & Co.

Waite, an expert on rating techniques, conceived the idea of identifying training needs as a by-product of setting up a rating program. He carried out his project at a large chemical refinery.

In setting up a "forced-choice" performance report, it is necessary to obtain essay-type descriptions from supervisory personnel about job performance, personnel relations, personal characteristics, general abilities, etc. Then descriptive statements about work performance are extracted from the description—some favorable, others unfavorable—to be used in rating subordinates.

Waite's idea was to analyze training needs by having supervisors rate a special cross-section of foremen. He prepared "information sheets" with random listings of 842 descriptive statements, classified by work groupings such as manner of work performance, potentiality, etc.; and 241 foremen were selected to be rated by their senior supervisors (on a scale of 1 to 5 for each statement).

Sample statements:

—Keeps men safety conscious.

—Promotes high working morale.

—Can give criticism without arousing resentment in subordinates.

—Needs to know more about company rules and policies.

—Does not delegate enough responsibility to his men.

When the ratings were analyzed, it was found that almost all the foremen were rated favorably in certain categories. Safety, for instance, as judged by the percentage of favorable ratings, was obviously one of the strongest points among the foremen studied. Waite concluded there would be little reason to place extreme emphasis on special safety training.

In other categories, however, the percentage of unfavorable ratings indicated that a real need existed.

Consultant Waite thinks that many areas, once they have been adequately identified, can be improved through training. Writing in the *Journal of the American Society of Training Directors,* Waite lists some of the improvable areas he found in the chemical refinery:

Company rules and policies: A substantial number of the rated foremen were considered deficient in knowledge and understanding of established rules and policies. There was no lack of willingness, only lack of understanding. Thus, many of the foremen were incap-

Rendering Unto Caesar . . .

Julius Caesar would make a good corporation top executive, declares a student of U. S. business affairs.

"What big business wants," says Dr. Eugene E. Jennings of Michigan State University, "is the 'Mature Autocrat'—a man who is willing to take initiative and assume authority. He is decisive but not obnoxious."

Top executives are not intellectuals as a rule, reports Jennings. Instead, they are energetic and ambitious, with a practical intelligence that is hard to measure—"a cleverness in seeing arrangements and associations which have not existed previously, and the drive and power to implement them for the company."

One of the top executive's most delicate tasks, according to Jennings, is to motivate subordinates to give advice freely, when asked, but to prevent them from feeling insecure if the advice is not taken. That is why the shrewd top executive puts faith in committees: "He will sound out individual opinion previously to help guide his own decision making, and then seek a stamp of approval by the committee for his own opinion."

"This is an old, old story," he concludes. "Nearly all great men have tried to surround themselves with loyal, faithful men willing to work under them."

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able of applying policies if the case deviated from personal experience.

Labor relations: The company policy with respect to labor, as distinct from the formal terms of the labor contract, was not understood by the foremen. Also, many were considered to have little appreciation of the aims and purposes of the labor union. Only about 40% were said to "keep abreast of labor legislation."

Handling men: Many of the foremen were rated unfavorably in such matters as disciplining men, using incentives, knowing how to criticize, knowing when to praise and when to blame.

Delegating responsibility: There was considerable evidence of the need for basic clarifications. The problem included such things as how to give assignments, when to tell a subordinate what to do and when to tell him how to do it, how to develop the attitude for assuming responsibility, and how to dispose of details.

Planning activities and organization: Deficiencies were found in estimating time, personnel, and equipment needed for job activities. More important, however, was the need for developing favorable attitudes in the foremen toward planning.

Training activities: Many foremen were rated unfavorably as trainers and developers of subordinate personnel. There appeared to be a definite need for better attitudes, not simply improvements in "how to instruct."

Communication, oral and written: A need was indicated for training in public speaking, conference techniques, and report writing.

Personnel responsibility: This was poorly understood, particularly the function of personnel evaluation.

Waite also found a common weakness of serious import. Many of the foremen were rated unfavorably on a number of items involving a willingness to change. This emphasizes that any training program must be accepted by the foremen. Unless he sees the need for improvement, greater knowledge of "what to do" is not likely to make a foreman change the way he does his job. ●

A Fresh Start for the BIM

LORD VERULAM (above), new chairman of the British Institute of Management, takes over what in many ways is a new organization. As *The Economist* expressed it: "The BIM has had to learn that the leaders of industry want information, not leadership or re-education."

Under its new management, the BIM hopes to become a channel between firms that lead in good management practices and those anxious to learn from "the man who has done it."

Behind the new BIM, there is this story:

When the British government withdrew its subsidy not so long ago, there were predictions that the BIM would wither away. Instead, the business community subscribed £100,000 in emergency funds; with this mandate, BIM leaders did some serious searching for new reference points.

The basic question: What is the proper function of a management organization? Every management organization must find its own answer, of course. And the correct answer is marked by organization growth, not by formal objectives.

BIM's handicap was that its objectives were too precise, too manifold, and, to many businessmen, too "starry eyed." Its main functions, as defined at its founding 12 years ago, were to take the lead in promoting research into management problems; to help develop training and education schemes; to propagate good management practices; to bring the specialist organizations together by affiliation; and to become a professional body with defined grades.

Its leaders worked hard and selflessly, but the objectives proved hard to meet.

Most businessmen think of "management research" as what a good firm does in the heat of action, *The Economist* points out. Unfortunately for the BIM, the job of telling British industry what the best firms do was largely taken over by the British (originally the Anglo-American) Council on Productivity. And this organization proved to be the "spearhead of lively thinking among managers."

The highly successful Institute of Directors, with overlapping objectives, more finances, and a "senior sounding" name, also hurt the BIM's prestige.

Working relationships with the specialist groups were seriously hampered by business politics. "Far too much was heard," commented *The Economist*, "about squabbles between bodies for which nobody cared much except those pioneers of the 'management movement' who happened to have spent lifetimes building them up."

It took over 10 years for the BIM to become a "professional body with defined grades"—through a partial federation with the Institute of Industrial Administration, which gives examinations and certificates in general management.

Whatever the outcome of this uneasy marriage, the BIM seems to have abandoned its obsession with professional status. "Industry is immensely concerned with status," commented *The Economist*, "but not in terms of letters or degrees."

Lord Verulam, who excelled in the classics at Eton and read zoology at Oxford, is not likely to be greatly concerned about "letters and degrees." Now only 49 years old, Lord Verulam has been chairman of the Enfield Rolling Mills Ltd. since 1949, and is chairman of half a dozen other enterprises as well.

The new BIM, devoid of its expensive club building and dependent on its membership for funds, will emphasize regional activities. The purpose will be to bring together men with similar problems. ●

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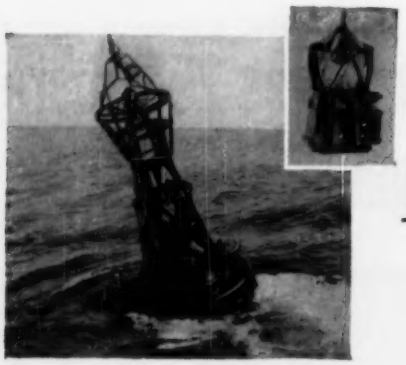

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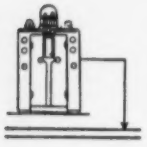

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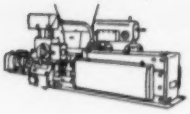

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Are Incentive Schemes Dead?

"HAS NOT THE TIME COME for a real shake-up on the subject of payment-by-results?" personnel manager R. R. Hopkins asks in an address over the British Broadcasting Corporation.

Incentives work best, according to a study made by Britain's Industrial Health Board a few years ago, in plants where groups are small, compact and stable . . . on the same type of work . . . with a short, repetitive work cycle . . . few variations in materials . . . and where the group earns a reasonable bonus.

In many cases, incentive schemes were introduced where these conditions did not apply, Hopkins says. In other cases, changes have blunted the schemes—special payments for non-production workers, material shortages, factory reorganizations, holidays, etc. There has been a growing tendency to guarantee a minimum pay-packet. And there is still the unsolved problem of maintaining a reasonable balance between straight-time and incentive payments.

Methods improvements have changed the emphasis from physical effort to production scheduling and planning, Hopkins notes.

Today, in more and more industries, output is controlled by market conditions; and the output must be in balance: there must be the same number of engines, axles, and car bodies, for instance.

Output is a management responsibility, at any rate. Why should part of the supervisor's job be done for him by an incentive plan? Even in times of difficulty, a good manager should be able to get additional effort without extra payments. And with machine-paced work, extra workers might have to be recruited anyway.

What of the problems of changing from incentives to straight-time rates? In Hopkins' experience, workers appreciate the advantages of stable and regular pay. And with straight-time pay, workers have "virtually a vested interest" in improving efficiency.

But workers have a right to expect the same pay under the new

system as under incentives. This is not always easy to arrange.

In Hopkins' company, the new rate gave two-thirds of the people the same or somewhat better pay, the rest suffering an apparent loss (of not more than 2d. per hour). But Hopkins thinks the difference was made up by applying the consolidated rates to overtime, night-shift, holiday pay, and pensions.

A variety of important incentives need not be abandoned, Hopkins points out. There can still be fringe benefits, and such things as individual merit payments, service increments, profit sharing, etc. (*The Listener, July* 10, *p*42) ●

In Management

CRITICAL INCIDENT REPORTS —a system of recording actual examples of good and bad employee performance—have substantially reduced grievances on promotions in one U. S. company. In five years of using these reports, no promotional grievance has required arbitration; and non-senior men were promoted in 73% of the cases.

Daily records seem to be necessary: Studies have shown that half of the "critical incidents" are forgotten by the superior with weekly reports, three quarters are lost after two weeks. (*Personnel, Sept.-Oct., p*54)

BORDEAUX REGION of France has sent a mission on a tour of 13 U. S. cities to promote the region as a good place to build plants for supplying European and African markets.

A MANAGEMENT FORCE of 4,400 will have to be trained in Israel during the next five to 10 years, according to a survey made by New York University, under a U. S. assistance agreement.

Training needs have been determined by a "need analysis" survey and other types of research. Six University professors are in Israel helping to set up management training programs in colleges, industrial firms, and among professional groups.

Seminars and in-plant study tours are being arranged; colleges are setting up courses in advanced management techniques and collecting case history material.

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Financial Digest

Here are some interesting comments on world monetary reserves and the liquidity problem, from a staff paper of the International Monetary Fund:

—The problem should not be too difficult over the next decade—assuming improvements in economic balance, no new obstacles to trade, and a strengthened credit system.

—Gold output at current levels ($700-million a year) will make a substantial contribution to reserves. There is no proven need for an abrupt increase in volume or price.

—If economic factors are expansive in the industrial nations, industrial production and world trade will rise whether world liquidity increases at the same rate or not.

—No amount of reserve is adequate to finance a nation's continuous deficit resulting from excessive spending or insufficient revenues.

•

A private foreign bond issue—the first since 1914—has been placed on the West German capital market. It is a 50-million Deutschemark ($12-million) issue from the Anglo-American Corp. of South Africa, placed through the Deutsche Bank. Anglo-American is selling the bonds for the DeBeers Consolidated Mines.

The interest rate of 5½% is the lowest for an industrial bond to date in West Germany. Redeemable in 1964 and 1973, convertible to common shares, the bonds will be listed on the Frankfurt stock exchange. Banking circles expect more foreign offerings in the rapidly reviving West German capital market.

•

An Association of Investors has been formed in Argentina to protect the interests of investors, act as mediator with the government, and promote economic development. Potential foreign investors—principally American—will be invited to Buenos Aires next spring or summer. The aim is to encourage investments in the $100,000 to $500,000 range.

•

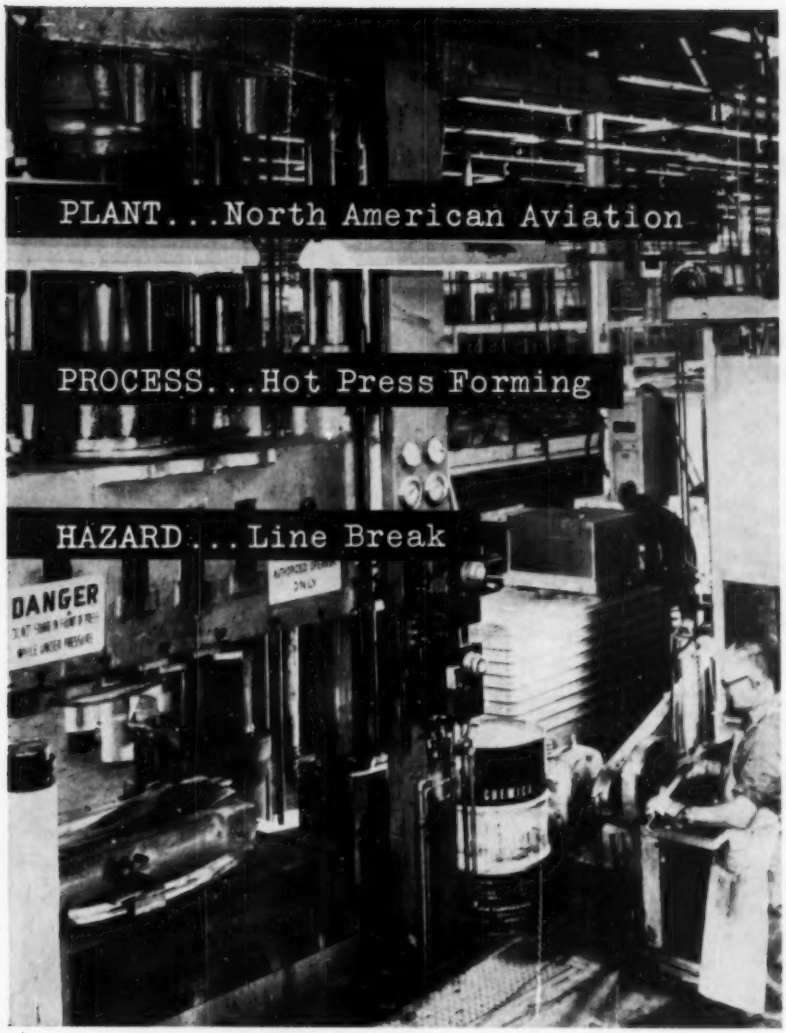
Commercial banks in Britain have made a revolutionary break with the nation's banking tradition. The Banks began by entering the "hire purchase" field, by buying into established financing companies. Then they announced an unsecured personal loan service for depositors, at low interest.

The latest innovation is a U.S.-style "personal checking account," with a fixed service charge (sixpence a check) and requiring no minimum balance. The objective is to convert lower income groups to paying by check instead of cash or money order. Perhaps the sharpest departure: The new checking plan is being widely advertised through newspapers, television, and movie theaters.

•

The big U. S. banks raised the interest rates paid on foreign time deposits to 2%, from 1¾%, in keeping with higher rates on short-term bankers acceptances and "commercial paper."

Japan's Supreme Export Council, a private group, has urged the Japanese government to extend long-term foreign credits to increase exports.



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Sweden, Stockholm.....Scandinavian Raw Materials A. B....Plastics.
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Switzerland, Zurich....Walter Aebli & Co....Yarns & fibers.
Syria, Damascus.....Sahmarani, Hammour & Cie ...Yarns & fibers.
Taiwan (Formosa), Taipei...Dah Chung Trading Co. ...Chemicals, plastics, resins, yarns & fibers.
West Germany, Hamburg..Karl O. Helm...Chemicals.
West Germany, Hamburg...Plastica Repenning K. G. ...Plastics.

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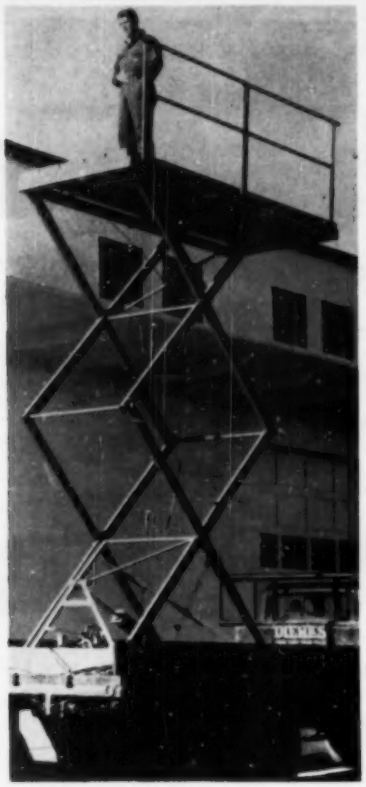
FORD

MOTOR COMPANY LIMITED · ENGLAND



Scaffold Rises To the Occasion

A hydraulic system raises and lowers this new scaffold platform, which is supported on an expanding scissors frame. The Sky Witch, as the scaffold is called, is available for truck mounting and in trailer-mounted and caster-base assemblies, and comes in a variety of sizes and models. Capacities range from 337.5 to 900 kg., and up to 2,250 kg. on special order. Standard models rise from 3 to 5.1 meters, special models up to 10.5 meters. **Charles Machine Works, P.O. Box 66, Perry, Oklahoma, U.S.A.**

Stick-Together Fastener

Zippers have a new competitor among buttonless closures for clothing, belts, shoes and upholstery. The new closure, Velcro, which is based on a Swiss invention, looks like two strips of mohair or fine carpeting. When the strips are stuck together they stay, and it takes a considerable pull to get them apart. Velcro is made up of tiny hooks molded into nylon filaments. It will not stick to other fabrics and will stand repeated washings and innumerable openings and fastenings.

The closures come in tape form and are easier to apply than a zipper, since the tape can be sewn on both sides, glued, or stapled down. **Int. Velcro Co., 32 rue Cesar Soulie, Nyon, Switzerland** and **American Velcro, Inc., Manchester, New Hampshire, U.S.A.**

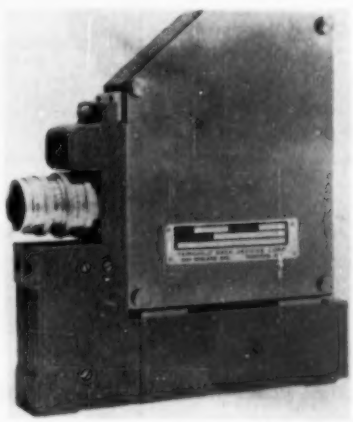
Shock-Resistant Glass Steel

A tough new glass with improved abrasion and thermal shock resistance has just come on the market.

As its name, Glasteel 59, suggests, the new material is used to coat steel. When coated, it has 30% greater thermal shock resistance and 20% greater abrasion resistance than ordinary glass. The cost remains about the same.

Glasteel 59 is not actually a new glass composition. But it does contain new additives which reduce the number and size of air bubbles usually found in glass-coated steel.

The new material resists all acids except hydrofluoric. Its resistance to alkalies is about twice that of normal laboratory ware. **Pfaudler Co., Rochester, N.Y., U.S.A.**



Flight Test Camera

This motion picture camera, designed for flight test research, can be installed in thin airfoils or directly on the surface of aircraft or missiles.

The camera (called Thinform model FDTF-001) is 3.125 cm. thick, 21.25 cm. high and 21 cm. deep. Without lens or film it weighs 2 kg. Operating speeds are 16, 24, 32 or 64 frames per second. It is built to operate at an altitude of 30,480 meters and at temperatures from −18 to 66C. **Fairchild Data Devices Corp., 580 Midland Ave., Yonkers, N.Y., U.S.A.**

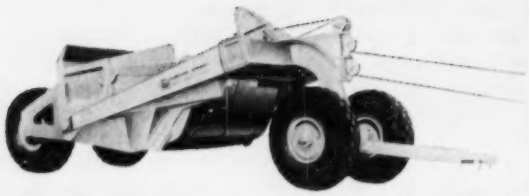
Ultrasonic Unit Makes Foil Airtight

The ultrasonic unit shown above welds aluminum foil in continuous seams, making it airtight and resistant to all penetration except puncture or tearing. This method of sealing, which supersedes the crimping, waxing or thermoplastic techniques, should be welcomed especially by the food industry. It may also hasten the acceptance of aluminum cans.

The welder, which is powered by a 100-watt ultrasonic generator, gives a weld that is said to be stronger than either of the pieces joined. Although designed as a hand unit, it can be built into automatic packaging lines. **Gulton Industries, Inc., 212 Durham Ave., Metuchen, New Jersey, U.S.A.**

WANTED

$5 per 1,000 for cancelled foreign stamps still on bits of paper from commercial mail. W. N. Emerson, P.O. Box 267, Lakeland, Florida.



MODEL CWT-8

8.0 cu. yds. STRUCK
10.5 cu. yds. HEAPED

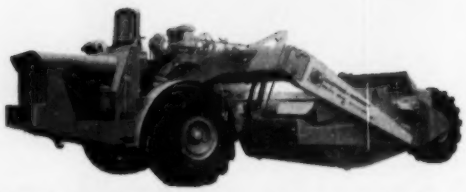
AVAILABLE IN 10.0 and 13.5 CU. YDS.

MODEL CW-27

7.0 cu. yds. STRUCK
10.0 cu. yds. HEAPED

MODEL CWT-15

15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED



MODEL CW-215

15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CWD-214 REAR DUMP UNIT

MODEL CWT-20

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CW-220

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CWT-26

26.0 cu. yds. STRUCK
33.0 cu. yds. HEAPED

MODEL CW-226

26.0 cu. yds. STRUCK
36.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CW-320

INTERCHANGEABLE WITH MODEL CWD-321 REAR DUMP UNIT

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CWD-321

INTERCHANGEABLE WITH MODEL CW-320 SCRAPER UNIT

21.0 cu. yds. STRUCK
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35-TON LOAD CAPACITY

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Curtiss-Wright Construction Machinery offers the most extensive scraper line in the industry! These rugged, dependable high speed machines — produced at South Bend — incorporate design features that give contractors the versatility and performance that pays off in lower costs-per-yard and bigger profits on any earthmoving job.

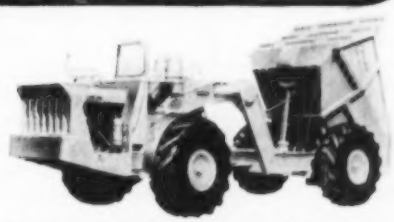
And supporting performance in the field is the nationwide network of Curtiss-Wright distributors with a staff of factory-trained service personnel and extensive parts stocks. Factory parts depots located strategically throughout the country cut downtime on major overhauls too.

For scraper performance that means bigger earth moving profits — see your Curtiss-Wright Construction Machinery distributor today.

SOUTH BEND DIVISION
CURTISS-WRIGHT CORPORATION
SOUTH BEND, INDIANA

MODEL CWT-30

30.0 cu. yds. STRUCK
39.0 cu. yds. HEAPED



MODEL CWD-214

INTERCHANGEABLE WITH MODEL CW-215 SCRAPER UNIT

14.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED
25-TON LOAD CAPACITY

New materials and ingenious designs produce packages that are more than mere containers. Often . . .

It Is the Package That

PACKAGING in the future will mean fewer clerks and more self-service in stores. It will mean far more convenience for consumers. New trends in packaging will provide more related-item combinations—including "cluster-packs" of staples and entire meals sold as units, menu-style.

These are views of leading U. S. packaging consultants, as told to *Printers' Ink*. To the magazine's question "What will packaging be like in 1968?", experts answered with the startling forms and shapes shown above. Packaging will progress rapidly, these experts say, in response to trends in marketing and consumer living.

Constantly shrinking space availability in stores will exert the strongest influence on packaging. As brand competition becomes fiercer, limitations on shelf space will necessitate more compact packages containing "less air and water." Retailers may resort to displaying sample packages only. Space limitation in homes may lead to packages which shrink as the contents are used. Round containers that roll down like stockings, rectangular boxes that telescope, may appear.

These predictions may sound more like 1984 than 1968. But they merely rely on a continuation of the dynamic growth rate set by packaging in the decade just passed. For packaging, long a laggard among distribution techniques, has spurted astoundingly in the last ten years.

For years manufacturers strived to produce an attractive, saleable product, then "hid their light under a bushel." The results of good design and clever styling often were concealed behind the drab anonymity of shipping crates and corrugated boxes. More and more, companies are realizing that regardless of the good qualities they have enclosed in their package, it is the package that the prospect sees.

Led by developments in the food and supermarket fields, many companies—even those in heavy industry—have revolutionized their packaging. Research has provided a host of new materials suitable for packaging. Films, foils, laminations, plastics, and aerosols have been adapted to some novel forms and uses.

Stimulated by these advances, businesses are reappraising their packaging, asking how well does it—

Contain. Does it protect the contents from the internal dangers of contamination and the external threats of pilferage, rough handling, inclement weather?

Travel. Is it compact, does it fit easily with other containers? Is it portable, easy to handle? Can it be reused?

Sell. Will it attract customers? Can you convert it from a container into a display case?

Operate. Does it pour, squirt, spray, or otherwise dispense the product properly? Are instructions clear, adequate? Does its appearance create repeat sales?

These are only a few of the tests that should be applied to your packaging. But they indicate the great variety of roles now filled by the once lowly container. And the range of these questions suggests why packaging has lagged behind other distribution techniques. For packaging decisions cut across traditional organization lines, affect many departments.

Consider the number of diverse functions affected by the question of what identification should appear on a package. Engineering and production men want a container that can be quickly and properly used by factory and stockroom personnel. To reduce handling in transit and warehouse, traffic men require a package that can be identified from any position. Public relations men want to present the corporate image as frequently as possible.

For the sales department, the ideal package quickly transmits a

NERY changes corrugated boxes into colorful containers.

PLASTIC DISPENSERS make products easier to use.

Sells the Product

colorful appeal to the customer. And it should do so from any side, assuring that unfavorable placement cannot hide its message. Free space and promotional tie-ins attract the advertising department.

Look at the liquor packages illustrated in the photograph above —and note how they fulfill all these conditions. Such a well-designed package usually results from the efforts of a "packaging co-ordinator" who blends the needs of several departments into the finished package. He has a flourishing wonderland of new materials and processes to choose from to achieve this end.

Materials research continues to create new plastics, foils, and alloys suitable for packing. Heat applied to Cryovac shrinks the material to a form-fitting skin for irregularly shaped items. Polyethylene glues greatly increase the uses of this tough, transparent plastic.

"Gas sandwiches" of nitrogen or ammonia protect perishable foods wrapped in laminated paper. And sealing is simplified by self-adhering "cohesives", which form a strong bond but won't stick to anything else.

Printing processes have been adapted for use with the new materials. The packager can choose from letterpress, offset, rotogravure, flexography, silk-screen or embossing. And should product changes or special promotions render the original copy obsolete, new labels can be affixed by a heat application process.

Improved equipment has expedited packing. "Continuous flow processing is replacing intermittent stop-start operations," according to *Modern Packaging* magazine; speed and versatility characterize the latest machinery. And even retail outlets can do their own packing with the compact gas and vacuum units now available.

Creative design combines with the new materials for novel applications. Delicate, expensive electronic components now travel safely in polyethylene hammocks and polyurethane cushions. Aerosols dispense products as diverse as drugs and shoe polish, paints and whipped cream.

Simply rearranging tin cans along diagonals instead of in the conventional rectangle saves considerable carton space. Cake boxes now come in tapered shapes, providing built-in protection for the icing.

This kind of in-use design thinking has improved the package in each step of its existence, from delivery to shipper through to an afterlife as a useful object in its own right. Designing containers

WHOLE MEAL cooks inside bag.

SO LIGHT, yet it holds corrosive acid.

STAR HACKSAW BLADES

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● **FOR ECONOMY**—Long lasting, efficient cutting. They always justify their cost... no finer hacksaws are made—anywhere. *Inquiries invited from established agents in certain areas.*

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MIDDLETOWN, N. Y., U.S.A. 4874

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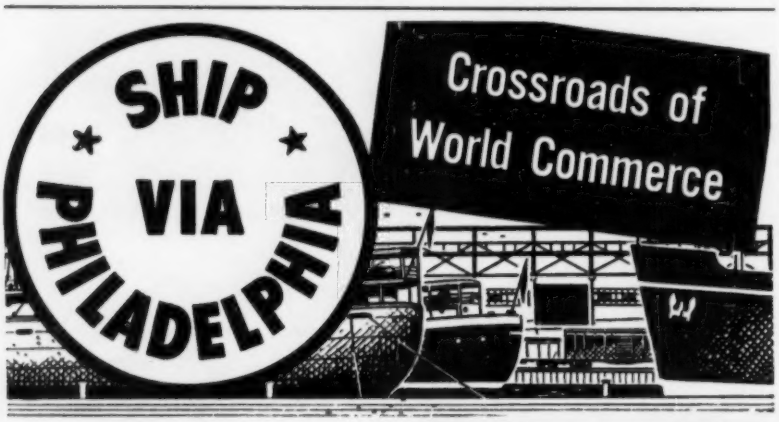

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with a view to their strength and compatability in a stack facilitates shipping and storage.

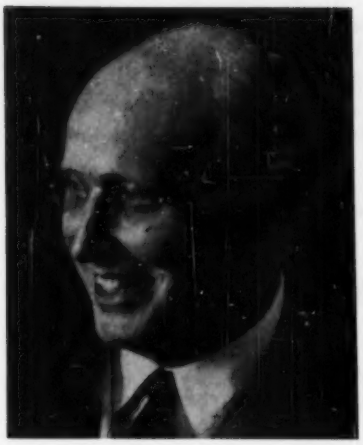
Ingenious packages encourage the retailer to give prominent display space to a particular item. Clothing, enclosed in transparent vinyl envelopes, can be inspected by customers without danger of soiling. Attractive fold-out cartons, which provide the retailer with a ready-made display unit, receive choice shelf locations.

Modern packagers, eager to stimulate repeat sales, consider every step in the customer's use, striving always for greater simplicity and ease. Fold-out cardboard handles, built right into a package, furnish a carrying case for bulky articles. Instructions now come printed right on the package, where they can't be mislaid. Since a recent survey revealed that packages get into some obscure positions on grocers' shelves and customers' cupboards, more food packers have been imprinting their product names on all sides of the package.

Ease of application characterizes the many products now squirted, squeezed and sprayed from a variety of aerosol containers and soft-plastic bottles. Perhaps the ultimate in convenient packages is reached in the harmless plastic envelope which dissolves while releasing its contents into a pan of boiling water.

And some companies expect their packages to be useful long after their contents have been disposed of. A bathing suit manufacturer puts his product into a clear vinyl pouch. Remove the suit, and the pouch can be inflated into a comfortable beach pillow. Candy and toiletries suppliers pack their products in attractive boxes suitable for storage or decoration. In this form their sales messages may last for years.

Despite the ingenuity shown in these packaging developments, designers should avoid becoming so engrossed with the package that they produce a lovely, but hollow, shell. Consultant Walter Landor warns his colleagues that customers may begin to suspect products are over-packaged, that they are being manipulated—or that they may feel plain "see-sickness" from viewing jarring colors and blatant design. ●



He Counts the Customers

A. C. NIELSEN (picture) has developed an answer for one of marketing's most baffling questions—how can you evaluate advertising and sales promotion?

His market research organization—the world's largest—surveys consumer goods marketing in ten European and Commonwealth countries and the U. S. It provides vitally important analyses of how their products are selling at the retail level for food and drug manufacturers. Radio and television advertisers rely strongly on his reports of the size and characteristics of their audiences.

Nielsen, an American engineer, refused to accept advertisers' claims that "you can't measure those things." As he says, "a man trained as an engineer naturally thinks things can be measured." Nielsen began measuring marketing's intangibles when U. S. drug manufacturers came to him seeking a yardstick for retail sales.

His solution combined engineering and statistical principles to arrive at an accurate gage of current sales trends. Nielsen discovered that a sample comprising only 2% of total buying volume can closely reflect conditions for a whole field—if the sample is selected with meticulous care.

Today his service supplies subscribers in the food and drug fields with information on:

—How their products are selling in various types of retail outlets.

—How well they compete with other brands.

—What retail price their goods, and their competitors', sell for.

—How effective a display, how good a location, how much promotional support they are getting from their dealers.

These facts—presented with an interpretation of their significance—enable suppliers to adjust marketing strategy quickly.

Radio and TV advertisers receive twice-monthly Nielsen Reports indicating the size of their audiences. His organization gathers this data from Audimeters—machines which automatically record listenership in selected homes. Again, the service depends on picking a small but truly representative sample. From only 1,200 sets scattered throughout the U. S., its data is 95% accurate.

Nielsen supplements these reports with analyses of viewers' age, sex and other characteristics. He garners this information from Audiologs—TV and radio diaries compiled by set owners.

His Instantaneous Audimeter gives British advertisers an even more useful measurement. This device registers audience reaction and relays it back to the advertiser while the show is still on the air.

This feature, exclusively British, shows how Nielsen is concentrating on the international phase of his operations. With a third of his $24-million revenues already coming from outside the U. S., Nielsen is considering expansion into Latin America and other European countries. Chicago is headquarters for A. C. Nielsen Co.

When first extending operations into a new country, Nielsen's clientele consists mainly of big international concerns, who value the uniform basis his reports give for comparing results in all countries. Nielsen exhaustively studies distribution patterns in a new country to assure a representative and uniform sample. Sometimes, national patterns require instituting an additional service. English subscribers get a Confectionery Index, Dutch users, a Tobacco Index, to supplement the regular reports.

Nielsen says his basic methods hold valid for all nations. And he says indigenous clients soon outnumber the international clients in each country. (*Printers' Ink, Sept. 12, p80*) ●

In Marketing

LATEST ARRIVAL in the turbulent U. S. auto market, the German Goliath, will try a novel distribution approach: cars will be sold through general merchandise stores. Goliath picked the large Gamble-Skogmo chain to test the approach in a Mid-Western U. S. location. If it succeeds there, Gamble-Skogmo may sell the Goliath throughout its more than 2,000-store system.

Both companies base their optimism on a recent survey indicating increasingly favorable prospects for imported cars, especially the German models. In addition to promoting the Goliath in the store, Gamble-Skogmo will encourage prospects to borrow the car for overnight demonstrations and will push sales through its house-to-house appliance salesmen. (*Business Week, Sept. 13, p55*)

ENGLISH CHANNEL shippers should consider three modern ways to overleap this troublesome strip of water between England and the Continent, says *Business* in its September issue. Despite their higher base rates, the three—transport ferry, road-air-road, and airfreight—may cost less than boat shipments when all related costs are compared (IMD, October, p55). Listing cost reductions in packing, damage, pilferage, inventory charges, insurance and dock dues, then citing the advantage of faster delivery, the magazine advises each business to investigate these newer forms of transport.

SELLING SENTENCES: Hallmark Cards hopes to extend the U. S. greeting card boom to Latin America with a Spanish language series . . . The first Continental "do-it-yourself" show will be held in Paris (Nov.1-15) . . . Explaining a 16% increase in imported candy sales, an American chain store buyer says: "People buy foreign cameras and see those little cars around so they're more interested in the novelty of foreign candy bars" . . . Encouraged by its reception at the Brussels Fair, the U. S. A.'s Brass Rail, Inc. plans an American-style restaurant chain in Europe.

Publications Digested

American Automobile
American Letter
American Machinist
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Business Week
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Control Engineering
El Automovil Americano
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Ingenieria Internacional Construccion
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Metalworking Production (London)
National Petroleum News
Nucleonics
Petroleum Week
Power
Product Engineering
Purchasing Week
Textile World
Today's Secretary
McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y.

American Builder, Marine Engineering, Railway Age, Railway Track and Structures, Railway Locomotive and Cars, Railway Signaling & Communications
Simmons-Boardman Publishing Corp., New York 17, N. Y.

American Business
Dartnell Publications, Inc., Chicago 40, Ill.

Architectural Record
F. W. Dodge Corp., New York 18, N. Y.

Business
Business Publications Ltd., Mercury House, London, S. E. 1

Ceramic Industry
Industrial Publications, Inc., Chicago 3, Ill.

The Controller
Controllers Institute of America, Inc., New York 16, N. Y.

The Economist
The Economist Newspaper, Ltd., London, S. W. 1

Harvard Business Review
Harvard University, Boston 63, Mass.

Heating, Piping & Air Conditioning
Keeney Publishing Co., Chicago 2, Ill.

Industrial Marketing
Advertising Publications, Inc., Chicago 1, Ill.

The Management Review, Personnel, Supervisory Management
American Management Association, New York 36, N. Y.

Metal Progress
American Society for Metals, Cleveland 3, Ohio

Modern Packaging, Modern Plastics
Breskin Publications, New York 22, N. Y.

The Paper Industry
Fritz Publications, Inc., Chicago 5, Ill.

Petroleum Press Service
Petroleum Press Service, London, E. C. 2

Plastics, The British Motor Ship
Temple Press, Ltd., London, E. C. 1

Printers' Ink
Printers' Ink Publishing Corp., Vision Inc., New York 22, N. Y.

Rubber and Plastic Age
Rubber and Technical Press, Ltd., London, S. W. 1

Sales Management
Bill Brothers Publishing Corp., New York 16, N. Y.

The Times Review of Industry
The Times Publishing Co., Ltd., London, E. C. 4

Welding Engineer
Welding Engineer Publications, Inc., Morton Grove, Ill.

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Amongst the many innovations Philips have introduced in industry electronic weighing is one of the most spectacular. For a minimum of outlay, electronic weighing makes possible e.g. the correct quantitative determination of the production components flowing through a factory. This modern technique is now applied the world over in various forms for:

- weighing heavy stationary objects such as tanks, hoppers, silos, bunkers, furnaces etc.,
- weighing railway carriages, trucks, piece goods etc. on platform scales,
- weighing material moved by conveyor belts,
- weighing crane loads.

To solve problems involving electronic control and production equipment, do as many have done before:

Better supervision

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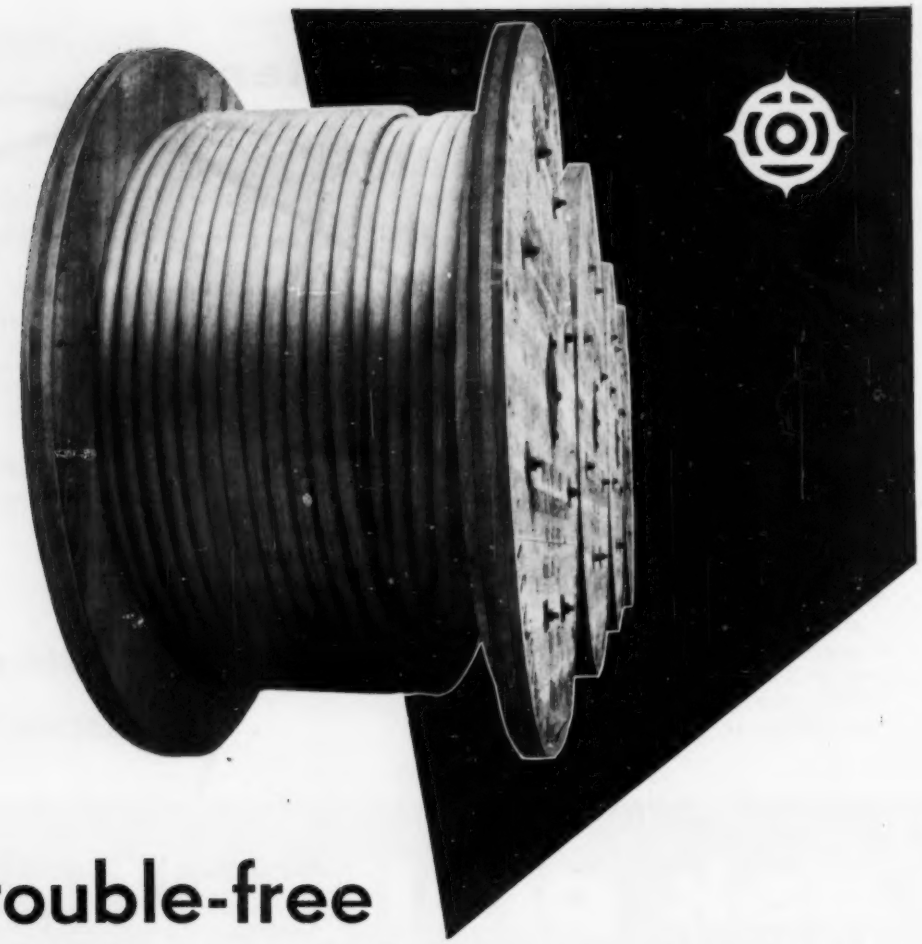
One out of many...

The N.V. Haardenfabriek en IJzergieterij St. Joseph v/h Hubert C. Beckers, Bergen op Zoom - Holland, makers of high quality fire-places and stoves, have equipped their modern L.F. induction furnaces with Philips electronic weighing equipment.
Two furnaces with a gross weight of 34 tons and a nett weight of 10 tons have each been provided with four 10-ton load cells PR 9226/10 and a recording potentiometer instrument PR 2210 P/21.
The overall accuracy is better than ± 25 kg.
Until recently there were no means whatsoever of determining the contents of smelting furnaces. However, thanks to the reliability and accuracy of the Philips electronic weighing equipment installed, this foundry has reached an optimum degree of efficiency.

Photograph by courtesy of N.V. Haardenfabriek en IJzergieterij (Iron Foundry & Stoves Factory Ltd.) St. Joseph v/h Hubert C. Beckers, Bergen op Zoom - Holland.

N.V. PHILIPS' GLOEILAMPENFABRIEKEN — EINDHOVEN — HOLLAND

(Organizations and agencies all over the world)



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YOU and Management Reading

Planning for Tomorrow's Profits

Long-Range Planning for Management is a collection of articles by leading management executives and consultants on business planning for long-term corporate growth. Among the topics covered are: organization, steps in planning, special problems of research, new products and plant location. $6.50. (Harper & Bros., 49 East 33rd Street, New York 16, N. Y.)

Automation in the Office

Men, Machines, and Methods in the Modern Office will provide help in solving the problems created by the mechanization of office equipment, systems and procedures. Specialists explain how to get employees to accept office innovations, and how to improve work efficiency. $3.75. (American Management Association, 1515 Broadway, New York 36, N. Y.)

How to Be a Better Executive

Developing Your Executive Skills is a handy reference guide to every skill necessary for executive success. It covers such topics as decision making, long-range planning, executive problem solving and working with others. 262 pages, $4.50. (McGraw-Hill Book Co. Inc., 330 West 42nd Street, New York 36, N. Y.) . . . The Learning Process for Managers is concerned with the manager's responsibility for developing the potential of his subordinates. It is an analysis of the techniques for teaching good management. 154 pages, $3.50. (Harper & Bros., 49 East 33rd Street, New York 16, N. Y.)

Handbook for the Foreign Trader

The New York Port Handbook 1958 will prove a useful reference guide for the foreign trader. It lists the foreign commerce services and facilities that are available at the Port of New York. 192 pages, $2.50. (Port Handbook Company, 225 Lafayette Street, New York 12, N. Y.)

The Peaceful Atom

Here are three books on aspects of atomic energy: Nuclear Reactor Experiments describes the work carried out by the staff of the Argonne National Laboratory. It covers such subjects as nuclear radiation detection and experiments with operating reactors. $8.00 or 57s. . . . Safety Aspects of Nuclear Reactors presents information relating to safety problems of nuclear power plants. $9.00 or 64s. (Both books are published by D. Van Nostrand Co. Ltd., 358 Kensington High Street, London W14, England) . . . Nuclear Radiation Detection will help you understand the problems of nuclear radiation detection and measurement. The properties and design of detectors and detection techniques are summarized. $10.00 or 70s. (McGraw-Hill Book Co. Inc., 330 West 42nd Street, New York 36, N. Y.)

Bulletins from Industry

Bulletin 8002 will tell you about Dorr-Oliver board plants for production of hardbard, particle board, insulating and gypsum board. (Dorr-Oliver Inc., Stamford, Connecticut) . . . Bulletin RP-58 describes typical applications of Rapid-Roller gravity conveyors, explains construction features, and tells how to select a roller conveyor. (The Rapids-Standard Co., Inc., Rapistan Bldg., Grand Rapids 2, Michigan)

YOU

Personal Affairs

Reading Faster, with More Comprehension

Reports, letters, magazines, newspapers, and books—the busy executive has many reasons for wanting to read faster.

There are known techniques and principles that can be applied in any language. Reading specialists have developed machines—using speed controls and flash units—for increasing reading efficiency. Home practice can help. And there is even a "how to" book on the subject: Cut Your Reading Time in Half, Development Research Institute, Inc., 500 Fifth Avenue, New York 36, $1.50.

The key is to break the habit of reading word by word. You must read in "phrase units"—the eye takes in whole thought units at a glance, with smooth and rhythmic eye movements.

The first step: Take a pencil and circle the meaningful phrases in a paragraph. Then read the passage, taking in each circle with one glance. With progress, use slash marks to divide the phrases.

Practice until the phrases "pop out" when you read.

The next step: Learn to look just above the line—literally "reading between the lines." This way, the eye takes in a much wider expanse.

Newspaper or magazine columns can actually be read with one "fixation" per line. To practice, draw a line down the center of a column; then read down the line, glancing once in the space above each line. (For wider columns, you may have to make more fixations.)

A simple technique called "indenting" can increase reading speed by 100 words a minute. Start reading slightly in from the left margin, and stop slightly before the right margin. Try using a piece of colored paper flush with the column margin—the eye will want to stop short of the barrier.

Comprehension and concentration are improved if you can anticipate what the author will say. Think along with him, as if he were talking. Is he biased? Does he have any hidden motives?

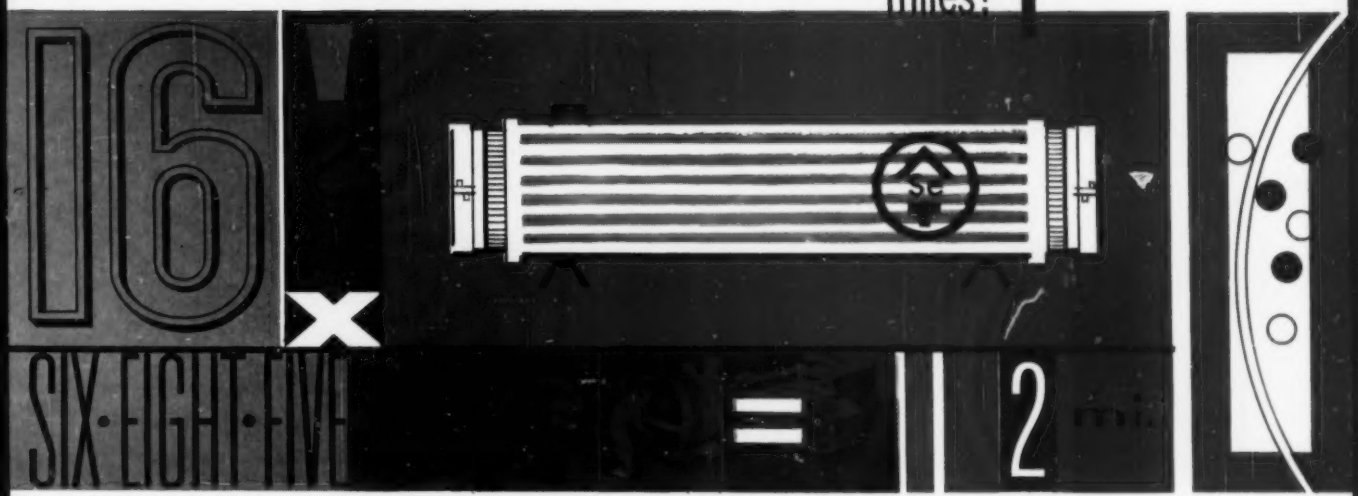
Pre-reading is a good practice. For a quick "overview" of an article, read the introductory paragraphs, the first sentences of the middle paragraphs, and the concluding paragraphs. Pre-reading saves time even if you go back and read with care—because you already know the gist. Skipping and skimming save time too.

Of course, reading speed must be regulated to the material. Difficult subjects obviously must be read slower than simple subjects.

Contemporary American Usage

What Fowler did for English usage (Modern English Usage, Oxford University Press, London E.C.4, $3.75) has now been done for American usage, in A Dictionary of Contemporary American Usage (Random House, 457 Madison Avenue, New York 22, $5.95). Like Fowler, it does not replace a standard dictionary; it is a series of short critical essays on word preferences, grammar, effective style, punctuation, idioms, spelling, etc. The authors (Bergen and Cornelia Evans) strongly disapprove of the use of cliches and hackneyed phrases, and the misuse of words such as Freudian and Rabelaisian ("to call any piece of indecency Rabelaisian is to utter a critical cliche and display an ignorance of Rabelais").

How does sixteen feet equal two miles?



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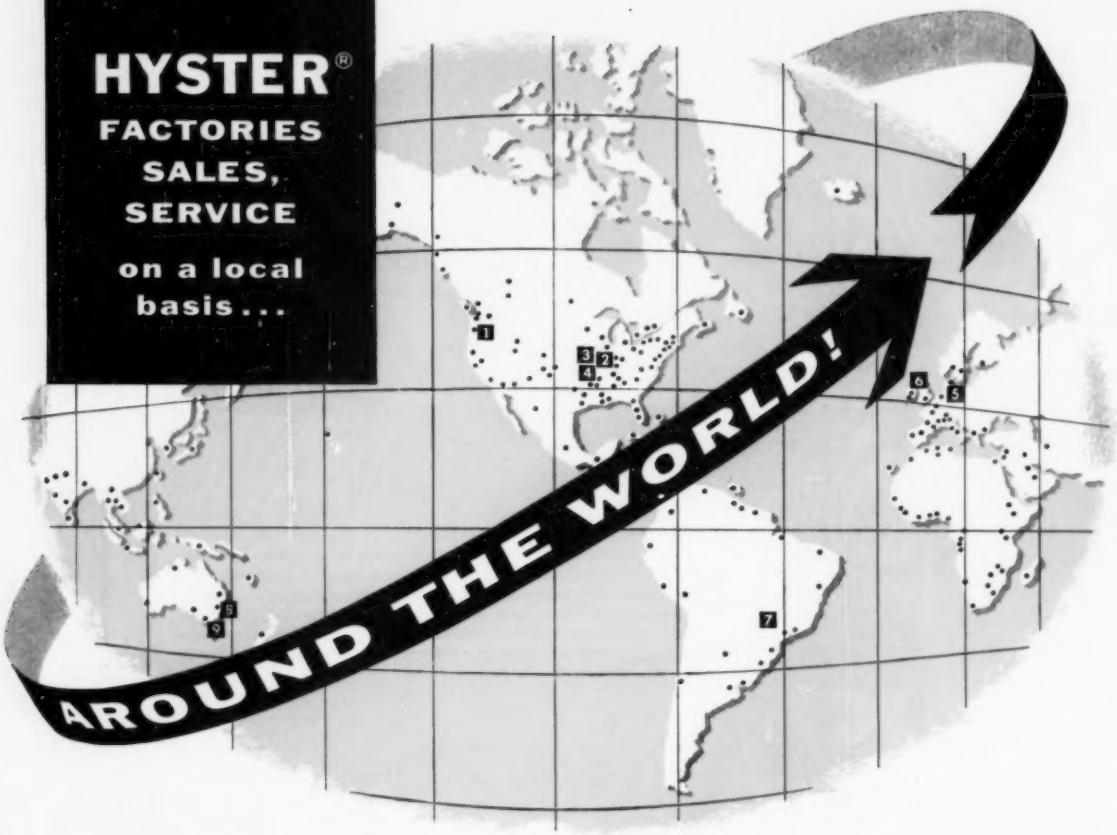

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